



TITLE:

THE ETHNOBOTANICAL STUDY OF ENSETE
(ENSETE VENTRICOSUM) IN THE
SOUTHWESTERN ETHIOPIA(Dissertation_全
文)

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CITATION:

Shigeta, Masayoshi. THE ETHNOBOTANICAL STUDY OF ENSETE (ENSETE VENTRICOSUM)
IN THE SOUTHWESTERN ETHIOPIA. 京都大学, 1992, 博士(農学)

ISSUE DATE:

1992-01-23

URL:

<https://doi.org/10.11501/3086425>

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IN THE SOUTHWESTERN ETHIOPIA

MASAYOSHI SHIGETA

1991

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CHAPTER I

INTRODUCTION

The primary purpose of this study is to present a comprehensive ethnobotanical description on the subsistence activities engaged by one of the sedentary agriculturalists in tropical Africa. Taking the ensete, a banana-like crop endemic to Ethiopia, and the Ari, the ensete cultivator of southwestern Ethiopia as an example, I have attempted to analyze the inter-relationships between plants and persons through the examination of various aspects of peoples' utilization of plants and recognition of the diversity of plants. However, the emphasis is undoubtedly placed on the conventional ethnobotanical viewpoints, that is how people utilize and recognize the cultivated plants in a particular cultural context.

The interest of person-plant relationships involving ensete and the Ari is two fold.

First and foremost, is the fact that both ensete and the Ari have not yet been well-known until very recently.

Ensete constitutes a staple part of the diet roughly covering 15 percent of the Ethiopian population (ca. 8 million according to the recent census) And in Ethiopia,

it should be noted that the farming system with ensete cultivation must be logically able to sustain a vast area of high population density. In addition to this fact, ensete holds diverse use as a typical multipurpose crop. And yet, few attempts have been made to elucidate its feature as a high-potential crop and as a culturally esteemed plant, so as it remained as one of the most unknown crops in Africa.

The Ari people, linguistically classified just a decade ago, belong to the Omotic stock of Afro-Asiatic group, and are one of the least studied ethnic groups of the southwestern Ethiopia in particular, and of Africa in general. Being unique as a contemporary sedentary agriculturalist in the tropical Africa, their sophisticated way of environmental manipulation including the management of ensete fields should be much worth considering. However, their ethnographical as well as ethnobotanical accounts focusing on the importance of ensete cultivation have been non existent.

Next point, if partially successful in this study, is related to propose the analytical framework of the ethnobotanical study of person-plant relationships as a demonstrative case-study of domestication. It can be stated that domestication is not an event, but a process of person-plant interactions, as pointed out by Anderson (1960)

However, it seems that most of the previous discussions on the issue of plant domestication have been presupposing that the human beings have been intentionally selecting

useful plants from among wild ones. This presumption is also the general reflection of our attitude towards the classification of the taxonomic "variety" of cultivated plants. It has long been believed that the peoples' "intention" and "utility" are absolutely necessary to create and maintain the new "variety" of cultivated plants.

The present study on the ensete-Ari relationships in relation to the creation and the maintenance of "variety" must provide a good counter example for the long-standing
(1)
dogmatic view on the domestication.

Domestication should be one of the key words of this study, because I believe that the essence of the subsistence activities of agriculturalists must be best understood as a process of interaction between human beings and the
(2)
plants.

The study on the ecology of individual crop species and differentiations of variety have been dealt with, to a very limited extent, in the scope of agronomy. However, these issues have rarely been examined in relation to the specific human societies, either. Nor the way of cultivated plants' survival in response to each human culture has hardly been
(3)
noted in anthropological studies of individual cultures.

Cultivated plants entrust their reproductive efforts almost entirely to human beings. Resultantly, cultivated plants have come to hold much convenient characteristics to us, i.e. loss of seed dormancy and shattering habit, and gigantisms of useful parts, etc. In other words, however,

by doing so, cultivated plants do try to survive at their best. It is cultivated plants that have chosen human beings as their agent of reproduction. Cultivated plants rely on human beings for their reproduction and at the same time the characteristics of plants themselves determined the part of people's culture and society.

The Ari people's unintentional deeds related to the conservation of wild ensete populations as a gene pool, which I called folk in-situ conservation, should be a typical example of such person-plant relationships.

I would like to contend that the both sides of the features of domestication, i.e., how people utilize the plant and at the same time, how the plant rely on the people, must be studied in one society. With the comparison of such first-hand data with others, we will be able to trace the historical change of person-plant relationships and to examine the typology of the relationships. This study constitutes a prelude of such an attempt to draw an overview of person-plant interactions and to examine the analysis of person-plant relationships as a conceptual framework on the study of domestication.

The remaining chapters of this volume consist of followings:

In Chapter 2, I make an overall survey of natural and social environments and the historical background and the economic activities of the Ari society

Chapter 3 presents the botanical description of ensete,

Ensete vetricosum (Welw.) E. E. Cheesman, based on the literature review and field observation.

The description of the relationships between the Ari and the ensete are the subject of Chapter 4. In this chapter, I try to describe the way of Ari's life in relation to their commitment to the ensete life cycle. Although the use of ensete as a food is predominant, it will be also of much importance that the ensete is used multipurposely and paid constant attention by the people.

In Chapter 5, the Ari people's cognition towards the variation of ensete landraces is discussed. I try to analyze and describe the Ari's way of classification of ensete based on their cognition of the characteristics of ensete landraces. And I will contend that the activities of the Ari people towards the ensete landraces must play an indispensable role in maintaining and increasing the diversity of landraces.

In the last chapter (Chapter 6), it is stated that the diversity of plants (ensete) which is a major premise of person's (Ari's) cognition is generated neither only by the person's efforts nor only by the plants themselves but the inter-relationships of both parties. And I will try to clarify that the person's perceptual behavior to plants is a major dynamic force to the "diversified selection" among those interactions between person and plants. I propose to call this type of diversified selection by person as "cognitive selection"

The main field research of the present study was conducted in the period between November 1986 and February 1987, and from October to December 1989. I stayed in Metsar village of former Bako-Gazer Worede (District), Geleb na Hamer-Bako Awaraia (Region) in Gemu-Gofa Kifra-bager (Province). Now the area has been reformed into Bako-Gazer Awaraia of South Omo Province in Ethiopia. The research area is approximately 35 km north of Jinka, present capital of South Omo Province, and in the Sida domain, the territory of one of traditional local chiefs of Ari (Figure 1).

NOTES

- (1) There are new trend on the study of plant domestication that is to regard the issue as person-plant (man-plant) interactions (Odum, 1971; Bye, 1979; Rindos, 1984). The term "domestication" is deliberately employed here as a sort of neutral words which avoids the "intention" of human beings transforming the plants into "cultivated plants". In the Japanese terminology there is no proper translation nor alternative terms for domestication. I have elsewhere discussed on the issues of domestication as a person-plant relationship (Shigeta, in press).
- (2) It is in the agricultural societies that the person-plant interactions must play the most important role for the subsistence of both human beings and plants. In his comprehensive analysis on the people-animal interaction

behavior based on the socio-cultural research in Eurasian pastoral nomads, Tani (1976:3) sharply pointed out that the subsistence activities of agricultural people can also be described as a kind of interaction oriented behavior.

However, he excluded the case of gathering and utilization of semi-cultivated plants from his consideration. I discussed on the person-plant relationships in relation to the wild plant utilization by agricultural people elsewhere (Shigeta, 1987a)

(3) The one of the pioneer works on this issue was done by Bye (1979) on the interaction between Tarahumara Indian in South America and the useful plants of genus Brassica. Jackson et al. (1980) and Brush et al (1981) were also dealing with the related issue.

CHAPTER II

THE ARI, AND THEIR SURROUNDINGS

The Ari is a collective and self-claimed term of reference of the people who speak the Ari language and reside in the Geleb na Hamer-Bako Awaraia (District) of Gemu-Gofa Kifra-hager (Province) and in the part of Gofa Awaraia.

2-1. Language of the Ari

The language of the Ari is first classified and named as Omotic by Fleming (1976). Previously, the Ari language had been classified as one of Western Cushitic such as the Sidamo (Murdock, 1959). In the same Omotic cluster, the Male, the Karo, the Banna and others were classified by Fleming (1976) as eastern Omotic, while the others like the Gimira, the Dizi and others as western Omotic (Figure 2)

2-2. Population and territory of traditional chief of the Ari

Total population of the Ari can be estimated as approximately 130,000. (The estimate is based on the census made by the Headquarters of Farmers Association in Jinka in December, 1986) Within Hamar-Bako AwaraJa, at least five territories of independent traditional chief are located (Figures 3 and 4) But there are unconfirmed information that two to three more baabi are regarded as the Ari's chief in the adjacent Gofa AwaraJa.

The dialect between five territories are said to differ in vocabularies from each other and called with the name of local territories as if they are independent languages, namely Sida aaf (Sida language) or Wuba aaf (Wuba language) and so forth. Recent survey of dialect similarities revealed that over 85 per cent of basic vocabulary are common among the territories (Carolyn, 1985)

2-3. Previous studies on the Ari

Although he did not mention the name of the Ari, Stigand (1910) tells us a broad account on the people in the Ari area.

It is the German ethnologists of the Frobenius Institute that first engaged the extensive pioneer work on

the several ethnic groups of southwestern Ethiopia (Jensen, 1959). In the report, Dr. Haberland (1959) made an interesting remark on the Ari as one of archaic people of Africa with pygmoid characteristics. At the time of expedition, German ethnologists could not identify the range of Ari territory and counting several chief's area as different ethnic groups.

While, the ethnological studies on the caste system and ancestral worship are done by Matsuzono (1975, 1979), however, so far, none has been tried on the study of their subsistence economy.

2-4. Temperature, precipitation, and vegetation in the Ari area

The temperature at Jinka is the highest in February. The average maximum temperature at Jinka is over 30 C. and the annual mean minimum temperature does not go below 13 C. Annual mean temperature at Bako is 21.8 C at maximum, 10.9 C at minimum and at average 16.4 C (Butzer, 1971).

The area up to 1,600 or 2,000 m has distinct dry and wet seasons in a year. The period from the middle of November to March is called hassim, dry season, and the remaining months are called bergi, wet season, in their folk terminology. Generally speaking, the higher the altitude is, the more the precipitation is expected in the Ariland.

And from the east towards the west, and from the north to the south the precipitation decreases. The average annual rainfall at Jinka town of 1,480 m above sea level is about 1,000 mm, at Gazer 1,200 mm and at Bako about 1,400 mm, respectively (Gamachu 1977;41)

The vegetation of the Ari area can be divided into three altitudinal zones. The zone below 1,600 m is Acacia savannah woodland and the zone between 1,600 and 2,200 m is a lower moist highland forest indicated by Cordia-Albizzia-Ficus trees. The zone above 2,200 m up to 3,400 m is a moist mountain woodland with Arundinaria bamboo and Hagenia.

2-5. The contrast between the lowland, dawla and the highland, dizi

The area of habitation of Ari people is located at the southern end of the Abyssinian Highland and the western side of the Great Rift Valley. The altitude of the area is ranging from 800 m to 3,375 m at the highest peak of Mt. Garagil. As shown in Figure 2, the area is higher towards northeastern part and lower to the southwest. And it is distinctive that all the five realms of traditional chief, baabi include both highland and lowland. The Ari call the highland as dizi and the lowland as dawla. Although this folk classification of altitudinal zone is rather imprecise, it can be considered that the highland and the lowland are

divided at approximately 1,600 m high above sea level with an intermediate zone. The Ari regard dizi as the land of barley and ensete, and dawla as that of coffee and sorghum.

2-6. Periodical barter market in the Ari area

Symbolic contrast between highland and lowland is most clearly appeared in the barter exchange of agricultural products held at the markets of intermediate zone. In the market, products from both highland and lowland are exchanged without using money. And fermented products from ensete from highland are most commonly exchanged with green coffee leaves. The green coffee leaves are boiled and filtered to make hot drinks.

2-7 Ari people's subsistence activities other than agriculture

Though Ari's subsistence is largely dependent on agricultural activities, fishing is sporadically engaged in the lower part of the Maki river, Neri river and Sala river using fish-poison. Hunting is hardly done in the area above 1,600 m but said to be common in the lowland in dry season. Both fishing and hunting play only a negligible role in their subsistence activities. Herding is neither

significant in the highland.

However, in the southern and western border of Ari territory, the pastoral people such as the Banna, Mursi and Bodi, are increasing the importance of pastoral activities in their subsistence. In the area around 1,600 m high, cattle herding is rarely done but sheep and goats are relatively abundant. Few households keep donkey, mule and/or cattle for loading purposes.

Livestock are taken for grazing in the fallow field or communal grazing area which is often located near the river. When stocks are grazing, either small or large, they are tied on their back foot with rope of five to ten meters long which is bound to the tree at the other end.

2-8. Folk classification of cultivated plants by the Ari; tika and ishin dichotomy

Ari's homesteads are semi-permanent and scattered (Plate 1) Houses are round shaped with conical roofs thatched by dry grass. Granary with high floor and fire place for cooking are often made outside of the house. The door way in front of the house is called maal. Maal is the place where processing such as drying and threshing of the harvest, maintenance of tool and several social activities are conducted.

Around the houses of Ari, ensete (Ensete ventricosum).

yam (Dioscorea sp.), taro (Colocasia esculenta Schott), coffee (Coffea arabica L.) and other perennial crops are mix-cropped with annual crops such as cowpea (Vigna unguiculata Walp.), Phaseolus bean and kales (Brassica sp.) The garden just around the house is called tika haami. On the other hand, the field apart from the compound is called wony haami. The central meaning of the word wony is "labor" Haami literally means the place where the crop is growing. In the wony haami, cereal crops such as sorghum (Sorghum bicolor (L.) Moench), maize (Zea mays L.), tef (Eragrostis tef (Zucc.) Trotter) and barley (Hordeum vulgare L.), and the grain legumes such as Faba bean (Vicia faba L.), pea (Pisum sativum L.) and lentil (Lens esculenta Moench) are cultivated. Crops cultivated in the wony haami is collectively called ishin.

Ishin is contrasted to the word tika which collectively designates the crops such as ensete, yam, taro, kale and so on. Several kinds of communal labor is performed in the wony haami, but not in tika haami where most of the work is done by the members of the family living in the house.

2-9. Traditional chief, baabi, and ritual master, godomi of the Ari

The territory of the Ari is divided into five regions each of which are represented by the local chief called

baabi. In the baabi's region, there are several religious specialists called godomi. The baabi's region is sometimes subdivided and represented by the godomi. The godomi's area is called after the name of original clan of the area.

For example, in the area called Dunamer, the godomi is from the Duna clan who performs several rituals such as rainmaking, starting of first planting and harvest, pest control etc. The word 'mer' means the land, so that Dunamer literally means the land of Duna clan.

2-10. Lineage, clan and moiety of the Ari

Mata wolaka is the head person of the godomi's area. He performs rituals of first harvest and birth ceremony among the members of his lineage.

Clan, toidi, following patri-lineal lines, are divided into moieties called Indi and Ber. The contrast between Indi and Ber moieties is the base of symbolic dichotomy of the Ari's world. For example, eastward direction, the sun from sunrise up to the noon and upwards direction, is symbolized by the Indi moiety. On the other hand, westward direction, sun from noon to the sunset and downward direction, is the symbolic beings of the Ber moiety. Ensete and other ishin crop such as barley, sorghum and tef are recognized as Indi's and coffee and cattle are Ber's.

2-11. Caste system

Conventionally the Ari society is further divided into three casts. They are called kantsa, gashimana and mana, respectively. Kantsa and gashimana share common clan names and the division of moieties. Though intermarriage between two castes are thoroughly prohibited, they can work together and are allowed to eat together. Mana is the lowest subordinated social group and is positioned as the group of special crafts-person such as blacksmith, wood carvers, and pottery makers. Kantsa and gashimana discriminate and avoid mana in many ways. They cannot marry each other and any form of their physical contact is strongly tabooed.

It is kantsa and gashimana who earnestly cultivate ensete. Mana are thought to have no fields by kantsa and gashimana but in reality they do have some fields of ensete and farm several cultivated plants.

2-12. The Ari after the Ethiopian Socialist revolution

After the socialist revolution in 1970's in Ethiopia, the Ari society has started to have been integrated, to some extent, into the centralized organization of Addis Ababa

government in several ways. Most of the landlords are expelled and all of their lands are theoretically taken up by the central government. However, the life of local Ari farmers has appeared to have experienced little change. Farmer's Associations, Gaber Mahaber are established as the lowest administrative unit of the government and also as somehow autonomous organizations. However, at the moment, their main role is limited to the tax-collecting and conveying the information from the government.

CHAPTER III

ENSETÉ AS AN ENDEMIC CROP IN SOUTHWESTERN ETHIOPIA

3-1. A review on the previous studies on ensete

Ensete, Ensete ventricosum (Welw.) E. E. Cheesman, is a crop exclusively cultivated in the southwestern part of Ethiopia (Figure 5) though the wild form is widely distributed in the southwestern Ethiopia as well as the eastern, southern and some parts of central Africa.

Peculiar way of ensete cultivation and utilization have long been attracting eyes of travelers and keeping interest of explorers. Bruce (1790) left a first account on the ensete cultivation in the northern part of the Abyssinian Highland in the course of his survey on the source of the Nile. However, we have only a few literature which paid attention to this plant in the southern fringe of the highland. Stigand (1910) is among the few who traveled the Ari area in the late 19th century, described the ensete as "groves of what appeared to be bananas" when he first saw it in the Baka chief's area. He explained on the ensete saying, "These are in reality the wild banana, cultivated for the sake of its roots. Out of these the native make a

kind of bread." It should be noted that he mentioned the use of ensete as a material culture among the Ari people.

It is Smeds (1955), the leader of the Finnish-Scandinavian Geographical Expedition to Ethiopia in 1953-54, who first scientifically described the ensete cultivation in Ethiopia based on his field study of Sidamo area together with the comprehensive survey of the literatures.

Shack (1966), who did the social anthropological study of Gurage people in the central highland, called the area of ensete cultivation with digging stick as "Ensete Culture Complex Area". The digging stick is thought to be specific in the southwestern Ethiopia where ensete is cultivated. He also pointed out that the ensete complex area is clearly distinguished from the other area of grain cultivation with ox-ploughs in the north and that of pastoral dominant in the southern lowland.

Westphal (1975) has drawn an overall but more finely surveyed view of the distribution of the cultivated ensete in the highland and been suggesting four distinctive areas of ensete culture.

Sakamoto (1969) and Fukui (1971) made an extensive field survey on ensete cultivation and processing in the Kaffa Province as the first Japanese who reported on this crop. Nakao (1988) also mentioned that with a prior knowledge of wild ensete he collected in Nepal in 1952, he observed the cultivated ensete plants in Addis Ababa in 1968. All three of them were then the members of the Kyoto

University Scientific Expedition to Sahara and its surroundings (KUSES)

The taxonomical position of ensete in Musaceae was entirely clarified by Baker and Simmonds (1953), and Simmonds (1958, 1960a, 1960b, 1962, 1980) In this dissertation, this system is employed.

Nutritional research on ensete including dietary analysis has so far been moderately challenged (Ethiopian Nutritional Institute, 1980) Argen et al. (1968) gave the nutritional composition of several ensete dishes and pointed out the need of additional protein in the diet to make ensete as a staple food. Mulgeta (1987) recently reviewed the nutritional aspects of ensete.

Ensete has long been a neglected crop even though this crop supports a huge population in the highland. There are relatively few studies on this important crop. Bezuneh and Asrat (1966) is concisely giving the general account of ensete production in Ethiopia, and Bezuneh (1984) made the agronomical evaluation of ensete.

3-2. Differences between genera Ensete and Musa

Ensete, Ensete ventricosum (Welw.) E. B. Cheesman (Plate 2) is taxonomically closely related to the genus Musa, fruits banana, of Musaceae. This species looks much like Japanese bashoo (Musa basjoo Sieb. et Zucc.), and in

fact was used to have been classified as a species of Musa (Cheesman, 1947)

There are three main differences between the genera Musa and Ensete: (1) Ensete is a monocarpic species such as bamboo. (2) The wild species of Ensete are widely distributed in Africa. (3) The basic chromosome number of Ensete is nine but that of Musa is ten or eleven.

Cultivated ensete greatly differs from the cultivated banana in terms of the plant part exploited. In ensete, crude starch reserved in the cell-like form of pseudostem, and the underground corm⁽¹⁾ are utilized as food. The fruits of the ensete, whose shape looks like those of small banana, are not edible because of their large and hard seeds.

The other big difference between the two groups is found in the mode of propagation. Ensete does not naturally produce suckers like banana. For the propagation of ensete under conventional cultivation, seedlings induced by the artificial removal of apical meristem are used.

The whole of the inflorescence of ensete will remain on the branch for about one year and after maturing it will fall down on the ground without separating each fruits. This is one of the distinguishable characteristics of ensete from the genus Musa.

Table 1 lists up the difference between the genus Ensete and Musa.

NOTES

(1) Corm is a specialized stem. The underground stems which function as storage or overwintering mechanisms (Jones and Luchsinger, 1987) Many authors, e.g. Bruce (1790), Shack (1966) and others incorrectly described the underground part as a root.

3-3. Taxonomy and geographical distribution of the genus Ensete

At present, six species are taxonomically recognized in the genus Ensete as listed in Table 2 with their geographical distribution. Among them three are distributed in Africa. Those are E. ventricosum (Welw.) E. E. Cheesman, E. gillettii (De Wild) E. E. Cheesman, and E. homblei (Bequaert ex De Wild) E. E. Cheesman. Popular synonyms of E. ventricosum are Musa ensete Gmel. and Ensete edule (Gmel.) Horan. The wild form of E. ventricosum is widely distributed in Africa from Cameroun to East Africa and the Transvaal. However, its domesticated form is confined only in Ethiopia. The differences of these three wild species based on Baker and Simmonds (1953:409-410) are summarized in Table 3.

Among the ensete in the southwestern Ethiopia, there are cultivated populations and wild populations. Both are believed to be E. ventricosum according to my observation

and measurement of seed size in the field. The data collected by the author coincide with Baker and Simmonds (1953) (Table 4 and Plate 3).

Wild populations of ensete in the research area grow spontaneously in the wet place like swamp, and along the river side. They propagate exclusively by seeds. On the other hand, cultivated populations growing in the field are only propagated vegetatively by local farmers. However, in my observation there found no clear morphological difference between wild and cultivated populations which justify the separation of two populations as two different species. It seems that their variation considerably overlaps to each other.

3-4. Botanical characteristics of ensete

Ensete can be characterized as a large monocarpic unbranched herb, not suckering unless induced to do so, and the pseudostem often markedly swollen at the base (Purseglove, 1972)

Ensete has entomophilous flowers which produce abundant nectar with sweet smell. Several kinds of moths and bees, and possibly small bats are thought to be the pollinators. Although the rate of out-crossing is not yet studied, it is likely to occur in a certain rate.

The inflorescence of ensete is as large as 30 to 40 cm

in diameter and about one meter long as longest (Plate 4) Each flower starts flowering from the top to the bottom. Flowers has no petals but two small leaf blades which open slightly. It takes about three months for a whole ensete flower to finish flowering.

Under natural condition, the fruits of ensete (Plate 5) are often eaten by monkeys and birds that may be the agent of seed dispersal. Those growing along the river bank may disperse their seeds by water. Many seedlings grow from the seeds which have fallen down and remained underground. When the branch of fruits is buried underground, seedlings can be misidentified as suckers growing from nearby ensete plants.

According to my measurement and rough estimates, the plant body of ensete usually contained 60 to 70 per cent of water. Drought tolerance of ensete is considered to be very high. Under high water stress, leaves of ensete may be bent down along the midrib and the pseudostem may stand up vertically. Under wet condition, leaves tend to open horizontally.

The seeds of ensete are said to remain viable for more than 25 years (Simmonds, 1958).

In the area of altitude between 1,200 and 1,600 m where wild populations of ensete are found, there is almost no major disease of cultivated ensete. However, in the area over 1,800 m of altitude, several kinds of disease and insect damages are found among cultivated ensete. However, there have been a few number of pathological studies on

ensete disease. Yirgue and Bradbury (1968) reported the bacterial wilt incited by Xanthomonas musacearum sp. n. as causing heavy loss of the ensete at many localities in Ethiopia. Demeke (1986) cited this identification and attributed the transmission of the wilt pathogen to three insects, namely Pecilocarda nigrinervis, Pentalonia nigronervosa and Planococcus ficus. (See 4-1-3 for the detailed account of ensete disease).

CHAPTER IV

SEVERAL MODES OF ARI-ENSETTE RELATIONSHIPS

4-1. Life-cycle of ensete and its management

4-1-1. Cultivated population of ensete

There are great differences in their life-cycles between wild and cultivated population of ensete. Among the cultivated populations of ensete, adventitious buds which are artificially induced by the removal of apical growing point are used for propagation. It is this peculiar method of vegetative propagation of cultivated ensete that most distinctively differs from that of seed propagation of wild ensete.

Cultivated ensete, agemi, can be utilized for several purposes throughout a year once it reaches a certain stage of growth. Although the artificial production of seedlings for propagation can also be done throughout a year, it concentrates in the period between April and June when ishin crops are scarce.

The life-cycle of cultivated ensete will be described hereafter with the Ari vernacular terminology, employing a

case of my observation on the processing of the ensete of 60 cm in diameter at ground level with a height of approximately five meters.

First of all, the ensete plant for processing is cleaned by removing the dried outer leaves and taking out other refuse matter around the plant by hand sickle, wali, which is unique in this area. This is called as, "agemi po'o", literally means that the ensete is cleaned. And then the roots, chachi, near soil surface are cut with hand-hoe, gosha. At the same time, the soil around the plant is dug (agemi makish) by hand-hoe, gosha (Plate 6) After that the plant together with underground corm is carefully hold by hands and laid down on the ground. In some cases, before laying the plant down, upper leaves are cut off about two meters above the ground level.

The uprooted ensete is then cut into two parts with a special knife called washi arfi at the base of pseudostem which is about 10 to 20 cm above the ground level. The knife is 30 to 50 cm long and double edged. The upper part of the plant which contains white crude starch in the pseudostem may be used for processing fermented products of which the final products is called washi. The method of processing washi will be described later in this chapter

The lower part of the ensete plant is placed again on the ground as before it was cut, and its central parts containing the apical growing point is removed at five to 10 cm in diameter and 10 cm in depth by using the digging

stick, boila, and hand hoe, gosha. The lower part after removing the apical growing point is called maati. In some cases, especially when the lower part of the ensete is rather small, maati is vertically divided into two pieces and planted as the cut surface is facing upwards.

The hole made at the center of maati is filled up with soil. Maati should be planted at the different place from the original place the plant was growing. The process of making maati is expressed as agemi kora in Ari language.

About half a year or a year later, hundreds of seedlings are induced from adventitious buds and grow up to 30 to 40 cm high. Hence the each seedling, artsi, is directly transplanted to the gap of the home garden, tika haami. Or seedlings are often transplanted to the nursery garden near the house. This process of transplanting is called artsi wodi. And after a year so, grown up seedlings are re-transplanted to the garden. Whole of this process is also called agemi kora.

The whole work of making and taking care of maati is exclusively done by men.

Transplanted ensete seedlings to the home garden will grow up to mature as early as in one year in the case of the fastest varieties and in six years at the longest. At this stage, ensete can be utilized at any time throughout a year. The growth speed of ensete is to be much affected by the temperature. In an area above 3,000 m, it is said that the ensete take more than 10 years to reach maturity. However,

outer leaves and pseudostem of ensete can be always cut and utilized for several purposes even in the middle of the growth stage before maturity.

When the matured ensete are not fully utilized, they may happen to flower and seed in the tika haami. Once one of such ensete plants flowered, Ari people do not care about the plant and leave it alone. Flowered ensete is not used although the plant will soon use up the stored starch of pseudostem and underground corm, and finally die out leaving seeds.

I observed only six flowering ensete plants in the cultivated population in Dunamer village in three months period of the research. The total population of ensete in the village can be estimated as between 3,000 to 5,000. Although the survey is not done exhaustively, the rate of flowering in the cultivated population should be considered to be very low. Most probably the ratio of the flowering ensete should be very high in the home garden where the numbers of ensete exceed the subsistence demand by the family.

There are some other factors affecting the growing speed of ensete such as sun light, soil fertility, altitude, precipitation, temperature etc. which may directly or indirectly related to the flowering of ensete. Consequently it is rather difficult to find out the would-be flowering plants systematically in the fields. Synchronous flowering of same clone, like the case of bamboo, is not reported on

ensete (Simmonds, 1980)

Weeding is done sporadically. Two to three times a year is a common practice of weeding but people consider it not necessary in the densely planted fields.

Ari people do apply neither manure nor any form of chemical fertilizer to the ensete home garden. But house garbage, human stools, animal feces/manure and other debris are unintentionally thrown to the home garden surrounding the house which may contribute to enrich the organic matter content of soil.

4-1-2. Wild populations of ensete

The wild populations of ensete are propagated by seeds under natural condition. Because the ensete cannot develop the adventitious suckers in the course of its growth period like that of Musa species (fruit banana) Seed propagation is the only way for wild ensete to maintain their populations.

Wild ensete plants, propagating spontaneously by seeds, are collectively called gela by the Ari people (Plate 7)

The wild ensete grow in wetter places such as swamps, baz, and river bank, chaka. The wild ensete at the river bank may be sometimes cut down in order to clear the land for cultivation. They are also cut down because it is believed that the monkeys are attracted by the fruits of

ensete and attack nearby cereal crops such as sorghum. In contrast, the wild ensete at baz are not usually disturbed by human beings. Gela is usually growing with wild phoenix (Phoenix reclinata Jacq.) at baz.

Growth period of ensete from seed to flowering is not studied in detail. However, in the Ari area, people believe that the wild ensete grow more quickly than the cultivated ones and reach the flowering stage in a shorter period, i.e., one to two years.

Various differences between the wild and cultivated ensete population are listed in Table 5.

4-1-3. Pest and disease of ensete

The damage caused by either pest or disease on ensete plant is generally called agemi hajim which is the same terminology as human disease.

The Ari people mention two types of disease; durka and sada as the most common disease of ensete in the area. Durka shows the symptoms that firstly outer leaves become yellow and inner leaves and pseudostem gradually become wilting and finally whole plant dry out. Durka is infectious to the banana plant, (Musa sp.) Durka-infected banana-fruits change their color to yellow before maturing and dehiscent. Most probably the durka can be caused by bacterial wilt (Xanthomonas musacearum sp. n.) identified by

Yirgu and Bradbury (1968) The other possibility is that caused by one of the variety of fungi related to the pathogen of banana wilting disease (Fusarium oxysporum f sp.) which is very common among the East African cultivated bananas.

Ari people believe that the durka should spread through the fermented products of ensete called washi. Since the washi which was bought or exchanged at the periodical market, is thought to be a source of durka disease, the knife used for cooking such washi is treated with great care. If the living ensete is cut by such a knife, it is believed that the plant must get durka disease. So, people hate to bring in the washi from highland especially when they transplant the seedlings of ensete in their home garden. If the highland washi is brought in, the wrapping leaves and the remaining of washi should be burnt. Sometimes the edge of knife is also burnt. They do not mind eating the infected ensete. The hole which the infected ensete was dug up is filled with hot ash and charcoal. In the case of banana, they explain that the plant should be often left alone because it is hard work to dig up the whole banana plant.

Ari people believe that Sada is a disease caused by the moths (unidentified) In many cases the moths may be also called as sada. The sada disease shows the symptoms of take-all disease which seems to be caused by a certain race of fungi. Ari people explain the disease that the moths

excrete sticky substances on the leaves of ensete and banana and it cause the wilting of leaves and drying out of whole plant. Although the causal relationships between the disease and the moths is not clearly studied, the moths can be an agent of fungal infection. Corms and pseudostem of infected ensete do not deteriorate so that they can be eaten before completely drying out. The sada disease occurs most frequently in the dry season.

Apart from durka and sada, there are other diseases known to the Ari such as root rotting disease, sunu, and leaf blight disease, sola and so on. All these disease are believed to be brought from highland. But, they claim that the wild ensete has no damages caused by any disease or pest.

4-2. Ritual protection of ensete wild populations

Among the spontaneous habitats of the wild ensete population, there are certain areas called kaiduma, entering which is tabooed (Plate 8) Kaiduma is usually located near the village where water is always lodging in the stream, or swampy place called baz. In kaiduma wild ensete, gela, are always found, but not all of the spontaneous habitats of ensete should be considered as kaiduma.

It is believed that in the kaiduma there are fire-balls. Seeing them in daytime would be fatal, and even if

at night, one would suffer from serious sickness. Or it is said that there are huge snakes in kaiduma, and were one to step in there, he would either be killed by snake bite or go mad. Furthermore, kaiduma may never be cultivated under any circumstance. If someone should cultivate this area by mistake, he would die from the violation of this taboo.

However, these strong prohibitions do not completely prevent the Ari people from going into kaiduma. There are, like it or not, even some occasions for them to enter in kaiduma. For example, the water in kaiduma is indispensable for the ceremony of purification called sheena and gufa. For performing this ceremony, they dare to fetch small amounts of water from the place called shaata in the kaiduma where the water is always lodging. The water of shaata is believed to have the power of purifying the dirtiness caused by the violation of the taboo. This taboo called guma and its purification ceremony, are only known in the kantsa caste group.

Kaiduma is a place that holds the Ari people in fear as well as in awe. They are well aware of the fact that wild ensete plants, gela, grow in the kaiduma, propagating by seeds, and always flowering. They even point out that among the wild populations, they can find some of the same cultivated landraces of ensete. However, there are no case of transplanting gela to the garden or collecting seeds or seedlings from kaiduma.

According to the Ari's myth, wild ensete, gela was

planted by God, Sabii. Consequently, the spontaneous habitat of wild ensete is protected from human disturbance and destruction. Therefore, we could say that the kaiduma is a ritual sanctuary of the wild ensete population. However, people do not regard just the existence of wild ensete as a prerequisite for that area being a kaiduma. There are several spontaneous habitats of wild or escaped ensete where there are no kaiduma. Their conservation of wild ensete is backed by firm ritual belief but realized in very much an unconscious and indirect way

CHAPTER V

UTILIZATION OF ENSETE

Ensete is a typical multipurpose crop of which every part is thoroughly utilized by the Ari not only for food but also for several material cultures.

Throughout its growing period, the leaves and pseudostem are used for various purposes. Cut leaves of ensete are indispensable for wrapping, thatching, sheeting to sit, dressing as women's skirts, making containers, shading some crops and human beings from sunshine and also protecting them from rain.

The pseudostem yields very strong fibers, even when used unprocessed, for tying livestock, bundling harvests from the fields and so on. Dried fibers are whitish and strong enough to make high quality ropes. Most parts of the ensete plants are good fodder for livestock.

Since the plant contains a lot of water in cell-like structures in pseudostem, it is drought resistance to some extent. So some ensete are cut down for cattle feeding especially in the dry season when grass is scarce. A large number of ensete plants in tika haami around the house provide comfort, shading people as well as some kinds of crops such as coffee which need only moderate sunshine.

Ari distinguish and name the each parts of ensete in their folk terminology as shown in the Figure 6.

5-1. Ensete as a food crop

5-1-1. Processing of ensete

Ari people divide the edible portion of ensete into two parts. One is the reserve starch at the basal part of pseudostem and the other is the underground corm. Figure 7 schematizes the process of ensete utilization.

5-1-1-1. Fermented products of ensete, washi

The most important edible portion of ensete is the crude starch reserved in the basal part of pseudostem. The crude starch of the pseudostem is kept in the underground pit for several weeks and fermented. This fermented product is called washi which is one of the most favorite dishes of ensete among the Ari people. The way of processing and cooking washi is as follows:

First, the surrounding area of the ensete plant is cleaned up by removing dried leaves and pseudostem by hand sickle, wali. After cutting the shallow roots of the ensete by hand hoe, gosha, the whole plant with underground corm is laid down on the ground and cut at a little higher level

from the joint part between the corm and the pseudostem into two parts with a special knife called washi arfi. These procedures are almost same as those of preparing seedlings for vegetative propagation. In this case, women attend the process of digging out the ensete from the beginning although men are often requested to help them. After that, the processing and cooking are solely women's work.

Next, all of the pseudostem are separated to a single leaf sheath, and its inner soft skin, agemi looda, is peeled in order to remove daltsi nok, the water kept in the cell like structure. The bigger leaf sheath of the pseudostem is cut vertically and the water is shaken out.

Then the pseudostem pulp (parenchymatous tissue) is scratched out on a wooden board, called osuna ahaaka, reclining on the ensete plant at the degree of 70 to 80 near the hole of the dug-out ensete (Plate 9). Four to five fresh ensete leaves with the upper surface up are laid under the boards. Strings made of the ensete pseudostem fiber are tied at the neck of the board loosely. The prepared pseudostem is bent at the length of three quarter and hung on the string. The pulp is squeezed down out of the pseudostem by means of a split bamboo stick, called kamtsa, hold with both hands. This operation is called gumuzo ott (Plates 10, 11, 12, 13, 14, 15). After enough pulp is piled up on the ensete leaves under the board, it is smashed with the bamboo stick at once. This process is expressed in Ari as washi da'a and the products is called shakicha washi.

Before processing the pulp, shakicha washi, a fermentation pit, washi gola, should be prepared by the hand hoe, gosha, in the garden. The pit is about 20 to 30 cm in depth and 40 to 50 cm in diameter. First, at the bottom of the pit, two pseudostem strings are placed crossing. And ensete leaves, of which their midribs are removed, are laid in the pit. Each set of two leaves are placed at the bottom of the pit in a cross form with the upper surface down. In the same manner, the set of two leaves are placed to cover the soil surface in the pit. Only the last two leaves to cover the pulp should be placed with the shining side up.

The finished pulp, shakicha washi, is kept in the pit while the processing is going on. Pit is covered with ensete leaves so as the pulp not to get dry.

Golden colored fibers are left after squeezing off the pulp from the pseudostem. After drying, the fiber, goori, becomes whitish. The fiber which can be made into strong rope, is often sold at the local market.

After processing all the pseudostem, underground corms are also add to the shakicha washi. First, the corm is placed up side down on the leaf and its outer layer with soil and roots are thinly peeled off thinly by the knife, washi arfi. Next, the whitish and soft layer of three to five centimeters, called gooda is crushed by stone hold by hand. No special stone is kept as a utensil. After the gooda part removed, roots remain with the core part, laada. The roots are again cut off by the washi arfi.

The pulverized part of the corm is added to the shakicha washi made from pseudostem and kept in the pit for fermentation.

Shakicha washi is carefully wrapped with ensete leaves laid in the pit and tied with the strings placed at the very bottom of the pit. Leaves of ensete are further placed on it but no soil nor stones are placed on it.

The pit is left alone without opening for at least for seven to eight days long, or at longest for two weeks. When cooked, the necessary portion of washi is taken from the pit and the remainder is placed back in the pit.

The remaining part of the corm is called laada which is also added in some cases to the shakicha washi with the same processing method. In the special case, laada alone is wrapped with ensete leaves and kept for fermentation. This washi made from laada alone is said to be the best quality and its fermentation period is shorter than the ordinary one.

Crude starch can be also isolated from the shakicha washi which is piled under the board while processing shakicha washi. Mukuti is such starch deposited under the shakicha washi pulp. Mukuti can be cooked without further treatment. Mukuti is also purposely got from shakicha washi by keeping the squeezed water in a pot for overnight and making the crude starch deposited.

5-1-1-2. Corms, specialized stem of ensete, mosa

Mosa, in a strict sense, is a part of cell-like structure which is soft and rectangular shape between the underground corm and the base of pseudostem. However, the term mosa is more commonly applied to the name of dishes which use the underground corm together with the mosa, sensu strict. Practically the mosa includes the parts called tobi, tudi and laada as shown in the Figure 6.

Some of the corm have bitter taste which is not suitable for cooking as mosa. In such a case, all of the corm are processed and add to the shakicha washi.

The corm is usually cut into two or four parts vertically. One or more pieces of corm can be again added to the shakicha washi later.

The piece of corm should be cooked as mosa within a day or so, otherwise it would go bad. Half cut corm can be used for propagation of ensete as described before.

5-1-2. Cooking of ensete

5-1-2-1. Cooking methods of washi

5-1-2-1-1. Washi katsa (Ensete bread) (Plates 16, 17, 18, 19)

Washi katsa is the most common way of cooking washi.

The washi kept in the fermentation pit can be utilized after a week or so. The washi which is about 5 kg and shaped into a ball is taken out from the pit and cut by washi arfi many times in order to remove the fibrous substances called guncha. The fiber contained in the washi is called kali. The cut washi is kneaded well by hands and ground on the stone plate for more than ten times, removing solid or fibrous staff. This action is expressed as langetsa in Ari. After carefully removing fiber from the fermented substance, washi, it is shaped into a disk-like form with 3 to 4 cm in width and wrapped up in ensete leaves with the shining surface inside. No condiments nor even water are added. It is cooked on the clay pan for about half an hour in one side and for about 15 minutes on the other side. This, called washi katsa, is one of the most preferred dishes among the Ari. When someone says only washi it usually means the washi katsa. The baked washi which can be kept for about a week, is one of the common food among the Ari for traveling next to Basso, the powder of roasted barley.

The washi katsa made from deposited crude starch, mukuti, is also known and highly appreciated among the Ari because it does not contain fibers as that of laada washi does.

5-1-2-1-2. Washi daatsa (porridge made from washi)

Daatsa is a general term for porridge made from cereals

like maize, barley, sorghum, finger millet, tef and wheat. Washi is also made into porridge mixing with cereal powder which is called washi daatsa. Daatsa can be made into alcoholic drinks called gola when the powder of dried malt of barley or finger millet is added and kept for a week or so. This slightly alcoholic drink is also called as daatsa. It can be also made from both mukuti washi and laada washi and those are highly valued as is the case of washi katsa.

5-1-2-1-3. Wocha

Wocha, steam-boiled washi with vegetables in a pot, is also generally considered to be the food made from cereals. The washi is substituted for cereal flour, ila, as one of the cooking materials of wocha. The way of cooking wocha is as follows:

Following materials are necessary for the recipe of wocha for about five persons:

<u>washi</u>	5kg
leaves of kale	5 to 6 pieces
fresh bean; <u>wooka</u> or Lima bean; <u>lala</u>	about 300 g
salt; <u>soak</u>	a little
fat(cattle); <u>moora</u>	100 to 200 g
onion	2 to 3, small
size	
green pepper	2 to 3

First, fresh bean is boiled with a little water in a small cooking clay pot. Leaves of kale are placed at the bottom of the pot and a little salt is added. Then sliced

onion and meat fat are put together. The mouth of the pot is covered with an ensete leaf and tied with ensete fiber. After approximately five minutes later, cut green pepper is added. Last, prepared washi is placed on those previously put and extended by hand as it forms a layer of washi on the surface. Instead of washi, grain flour can be used. A hole reaching the bottom of the pot is made by a wooden stick in the center of the layer. Again the mouth of the pot is covered with an ensete leaf and tied up for about 15 minutes. Before serving, contents in the pot are thoroughly mixed with stick. Wocha is usually served on the fresh ensete leaves placed on the traditional wooden plate. Wocha is eaten by right hand.

5-1-2-2. Cooking methods of mosa

The corm and basal parts of pseudostem, which are collectively called mosa, are sometimes cut and boiled with vegetables in the clay pot. The name of this dish also is called mosa. However the name, mosa is also applied to the similar dishes using different materials such as taro, yam, plantain banana, and pumpkin.

For the cooking of mosa, several condiments, herbs and beans are used, that is one of the main differences from the cooking method of washi katsa. The outlook of mosa is similar with that of wocha.

Following materials are necessary for about five

persons:

<u>mosa</u>	5kg
leaves of kale	5 to 6 pieces
fresh bean; <u>wooka</u> or Lima bean; <u>lala</u>	about 300 g
salt; <u>soak</u>	a little
fat(cattle); <u>moora</u>	100 to 200 g
leaf onion; <u>shunkulut kal</u>	5 to 6 pieces
green pepper	2 to 3 pieces

Several kale leaves are placed at the bottom of the small cooking pot and the fresh Lima bean and small cut of mosa with a little water are added and boiled. Additional kale leaves are cut and added into the pot with a little salt. Green onion leaves and fat are cut to small pieces and added with a little salt again. The mouth of the pot is covered with a piece of ensete leaf and tied. After about 30 minutes later, mosa is ready for eating. Before serving mosa on a fresh green ensete leave, the ingredients in the pot are mixed and mashed in the pot with a wooden stick. Mosa is served without any side-dishes and eaten by a right hand.

The materials used for mosa cooking varies according to the available products in the season. Ensete mosa can be replaced with other starch crops such as sweet potato, taro, yam and pumpkin. Salt and kale leaves are indispensable for mosa but others can be omitted. Basic components of the mosa should be three kinds, namely ensete, kale and salt.

The basic form of mosa cooking must be as the steam-boiling of mosa part and corm of ensete. This method is especially applied for cooking bitter variety by

changing/adding water several times.

5-1-3. Beer made from flowering stem of ensete, agemi gola

The traditional beer which is collectively called as gola, is brewed with several kinds of cereals such as maize, sorghum, barley and finger millet. Materials varies in the different altitude and area.

There are four kinds of methods of brewing gola, which are called as wocha gola, lacha gola, daatsa and api, respectively. However, apart from these four gola varieties, there is a special kind of beer, as the highest ranking gola, called agemi gola. It is said that this beer, agemi gola, is occasionally brewed from the young flowering stems with high sugar content, which is rarely obtained among the cultivated populations of ensete. Although frequently flowering, wild ensete are not used for making beer. Neither the corm nor the pseudostem pulp is used for brewing beer.

5-1-4. The significance of fermentation

The utilization method of ensete for food can be classified into two groups. One is the fermentation method of pseudostem pulp and the other is the steam boiling method

of underground corm.

The significance of fermentation of ensete pseudostem pulp can be summarized as follows: First, it is to increase the crude starch yield by breaking the cell wall and cell membranes. Second, Ari people prefer the special taste and flavor of fermented ensete products. Third, the bitter taste of ensete is removed by fermentation. Last, the fermented products can be stored for longer period in the underground pit.

On the other hand, boiling is a common method of cooking for other starch crops such as taro and yam. Steam boiling is also considered as the method of removing bitter substances from these root crops.

In the Ari area, the fermented ensete is thought to be one of the most common ways of processing and eating ensete. However, some ensete are occasionally dug only for the purpose of eating underground corm. Even in such cases, upper ground part of ensete is thoroughly utilized for other purposes such as feeding livestock.

Smeds (1955:27) describes that in the northern part of ensete cultivation area in Ethiopia, basal part of pseudostem are to be boiled for eating. But this may be a incorrect information. Both Sakamoto (1969) and Shack (1966) reported the fermentation methods of processing ensete in Jimma and Gurage area which can be considered to be as one of the northern fringe of the distribution of ensete utilization in Ethiopia. It is also strange that

Smeds (1955) did not refer the fermentation method at all.

In relation to the ensete fermentation method, it is interesting to note that the very similar method of processing by fermentation is known among the Ari people when they use the corm of semi-wild dragon arum, Arisaema schimperanum Schott. (Plate 20). There are two varieties of A. schimperanum known to the people. One variety has pinkish large corm and the other has whitish small corm. White variety, tsala, can be processed and eaten in the same manner as ensete but reddish variety, torja, is too bitter to eat. As far as I know, there is no report of the corm of the genus Arisaema eaten as a staple food except as an emergency food in times of famine. Jordan (1967) did not list this plant in his "List of Foods used in Africa"

5-2. Ensete utilization as material cultures

It is interesting to note that almost all the material cultures made from ensete plants are "disposable", except the pseudostem fiber, goori. The parts utilized are mostly leaves and pseudostem. Most of them are made only from ensete plants without using other materials. The know-how of making ensete material cultures are widely distributed among the Ari people from the young to the old, of both sexes. Followings are the several ways of ensete utilization as material cultures.

5-2-1. Wrapping

Wrapping is a most common way of using fresh ensete leaves but pseudostem are also utilized for the same purpose. Fresh ensete leaves whose midribs are removed can be used for wrapping several kinds of objects. Leaves are indispensable for women in the local periodical market in order to wrap up the commercial goods such as fermented ensete, butter, coffee beans and several other agricultural products (Plate 21). When wrapping, the object is put on the two leaves which are placed in a cross form, and wrapped in a rectangular shape. It is cross-tied with pseudostem fibers and make it a kind of knapsack. Ensete leaves alone are sometimes sold in the market for wrapping purposes.

5-2-2. Carrying

Liquid such as water, milk and alcoholic drinks can be carried in a funnel-shaped container made from fresh ensete leaves. Eggs of chicken can be carried by putting them in a soft and cell-like structure of pseudostem with the both side-end of each egg tightened by fibers. Small hand bag is also made of ensete leaves and pseudostem as egg containers.

5-2-3. Tying

Strings made from cut pseudostem are most commonly used for tying. The strings or ropes made of fresh ensete pseudostem are tough enough to fix the load on the horse, donkey or mule. These ropes or strings made from ensete are not sold but given free in the market (Plate 22)

5-2-4. Sheeting (Matting)

Clean and fresh leaves are very important when serving cooked foods. Even when the food is served on the wooden plate; gonga, ensete leaves; agemi kal, is often placed on the plate. Cutting of the cooking materials is also done on the ensete leaves. Guests are offered fresh ensete leave mat to sit on the ground. Vendors in the market always sit on the ensete leaves, especially after the rain. Children are sometimes found selling ensete leaves in the market

(Plate 23)

5-2-5. Covering and sheltering

Leaves can be used as an instant umbrella. Sun-shading shelter is temporarily made of leaves of standing ensete when women process the fermented products of ensete in the home garden. Roof of the huts is sometimes thatched with ensete leaves. Ensete seedlings, maati, are covered with leaves to prevent them from too much drying in the heavy dry season. Leaves are used to wrap the mouth of the cooking pot tightly as described before.

5-2-6. Decorating or wearing

Fresh ensete leaves are occasionally used as clothes for women (Plate 24). Women in the periodical market are often seen wearing skirts made of ensete leaves. Ensete skirts are also worn in the ceremonial occasions such as funeral and wedding (Plate 25). A leaf which is long and clean enough for the purpose is carefully selected, cut in its middle part, and bent two-fold at the midrib. The leaf is torn along the direction of vein with the width of three to five centimeters leaving the midrib uncut and worn by tying at the waist. Some women also wear the tore leaves on their shoulders to the waist together with the ensete skirts. Men usually do not wear ensete clothes but

sometimes wear a cap made of ensete leaves.

5-3. Ritual usage of ensete

In the study area, no ritual performance or ceremonial events were found directly relating to the cultivation of ensete plants. On the other hand, agricultural rituals are commonly related to the cultivation of cereal and pulse crop which are categorized as ishin in their folk term. It may be indirectly related to the facts that the ensete, as a main crop of home garden, tika haami, can be utilized throughout the year, and that the cultivation of ishin crops has specific seasonality and discontinuity in their growing period.

Ensete often appears in the other ritual occasions such as wedding and funeral, but rarely in the agricultural ceremony. At funeral ceremony, people beat the pseudostems of ensete which are laid in circle on the ground as if they are drums. When people gather to attend the funeral from distant, they often come to the place crying with an ensete leave at their hands. Women wear the ensete leaves-clothes or skirts as described above.

The other conventional rather than ritual behavior by the people is that when the head of the homestead died, members of the lineage come to cut all the ensete plants. The people themselves interpret this peculiar behavior of

destruction as the expression of their sorrow and desperation.

5-4. Medicinal use of ensete

In the present research, no case of medicinal use of ensete plants was found, nor the other pseudo-medicinal usage, such as magical or religious application. Shack (1966:53) reports the usage of ensete roots of a specific variety only for medicinal purpose.

5-5. Other usage of ensete

Ensete plants not only provide the directly useful material cultures for Ari people, but also play several important indirect role in the various aspects of their daily life.

As a green fodder crop for livestock: Residue of processed washi is a good fodder for domestic animals such as cattle, sheep, goat, horse, mule and donkey. In the dry season when the pasture grass is scarce, ensete is occasionally cut down for subsidizing the daily feed for animals.

As a shelter and cover crop: Many ensete plants are densely planted in the home garden, tika haami, which

surrounds the homestead to shelter the house in the compound. Ensete is useful for this purpose since it is a perennial crop with abundant green leaves throughout a year. Ensete plants should also work as a kind of cover crop for other mix-planted crops such as coffee, yam, taro, kale, ensete seedlings etc., all of which grow nicely under moderate sunshine. Large and wide ensete leaves are also so good rain-catcher of heavy drops of rain in the wet season that excess compactness as well as the erosion of soil can be prevented.

In the area of approximately 1,600 m above sea level, coffee is regarded as one of the best companion crops with ensete. Since the coffee constitute a part of lower layer in the natural vegetation endemic to southwestern Ethiopia, the spatial structure of ensete garden mix-cropped with coffee must be modeling such a natural vegetation.

As a glove enclosing the household: Ensete is grown for physically sheltering the compound. Therefore, houses of the Ari are usually invisible from outside of the home garden. Because the Ari people dislike to be watched by others, when they are eating, particularly by the members of other lineage, they try to avoid visiting the scene of meal or even seeing the unfamiliar person eating. The woody variety of Dracaena sp. is also used for enclosing households from outside.

Seen from outside, the dense glove of ensete is so beautiful and looks like a forest that the Ari people highly

appreciate it as the symbol of hard-working by the members of the family residing. Shade of the tall ensete, sometimes over six to eight meters high, gives good comfort to the people. To the contrary, the poor ensete garden disgrace the family as the head of the family in the compound should be lazy, poodars. This situation can be expressed by a proverb as, "the root of yam coming upwards, instead of going down into the soil"

CHAPTER VI

THE IMPORTANCE OF ENSETE TO THE SUBSISTENCE OF THE ARI

6-1. The importance of ensete in the Ari agriculture

6-1-1. The importance of ensete as a cultivated plant of the Ari

The Ari holds a great wealth of crop diversity (Table 6) As described in Chapter 3, the crops of Ari are categorized into two groups, ishin and tika, in their folk classification of cultivated plants.

Tika is comprised of root crops such as yam, taro and ensete, coffee and other fruits trees, leaf vegetables and other minor crops found in the kitchen garden.

Ishin consists of grain crops such as barley, sorghum, tef and maize, and pulse crops such as lentil, pea and Faba bean. The Ari people regard the farming activity on ishin crop as "real" one, compared to the work done at the tika haami. People's attitude towards ishin crops can be well explained in the words, wony haami (field of labor), which is the field of ishin crops.

On the other hand, tika haami, field of tika crops, has such characteristics that food reserves where the food can be always obtained. It is undoubtedly true that the ensete, as a main crop in the tika, play the central role of giving such characteristics to the tika haami.

As described earlier, there is no ceremonial or ritual performance with regards to the cultivation of ensete as well as other tika crops, while on the ishin crops, it is common to perform several kinds of rituals such as sowing and first-harvesting ceremonies. Communal labor group is only organized for the work in the wony haami but not in the tika haami.

The key of all these contrasts can possibly be sought in the specific relationships between ensete plants and Ari people. Because people should intensively take care of ensete plants only at the beginning of ensete life cycle. After that, except for transplanting, they do not throw much physical labor into ensete cultivation by the time they finally use up the products. In-between the long life cycle of ensete, people may cut leaves sporadically but no weeding, manuring and other nursing are done. It can be even called that the food getting activity in the tika haami is somehow similar to the "gathering" mode of resource utilization.

This tendency is also shown in the agricultural calendar of the Ari area (Figure 8), where the cultivation of ishin crop has clear labor peak period while that of tika

crops, particularly ensete, has no major labor peak and can be utilized, if necessary, throughout the year. Ensete is such a crop that with enough land and moderate rainfall, its stable production can be assured. It is highly presumable that the productivity of ensete per unit labor input should be extremely high comparing to that of cereal crop.

6-1-2. Altitudinal difference of the intensity of ensete cultivation

As shown in Table 6, the frequency of ensete cultivation decreases as the altitude goes down. It seems that the importance of ensete as subsistence food crop also decreases as going to the lower area. This is mainly due to the limitation of annual rainfall, and also partly because of the diverse food resources in the lowland area.

In the lowland area at the altitude below 800 m, it should be difficult to cultivate ensete substantially because the annual precipitation of the area does not rarely go beyond 1000 mm. In such an area, for example, in the Baka territory that is the southern fringe of the Ari domain, some of the homesteads with no ensete plants are found.

6-1-3. Yield of ensete and its carrying capacity

It may be worth considering how many ensete plants are

necessary for a certain number of people to subsist solely on the ensete products.

Among the few reports on ensete cultivation in Ethiopia, there are only a few cases of estimating carrying capacity of ensete. Smeds (1955, n.d.) denotes that the three ensete plants can feed one person for a year. In his review article, Simmonds (1958) also presented the estimation of the rate of consumption of ensete as 12 plants per year per person. However, both estimations were not based on the actual measurement of the ensete yield in-situ.

After growing up to the certain stage, which takes approximately two to three years, ensete will have been able to be processed at any time of their life cycle. It is natural to expect that both the growth period to the maturity and yields depend on the varieties. Following is a case study on the ensete yields and the estimation of the carrying capacity of ensete based on the yield.

6-1-3-1. Estimation of the yield of ensete

The yield of ensete was recorded in January, 1987, at the homestead of Mr. M.W. in Duntseter village, Sido region. For the measurement, a local variety named kaksa was used.

The ensete was about three years old after the second transplanting (six years old from the seedling stage) and 5.2 m high. Maximum diameter of the cut pseudostem and the diameter at ground level are shown in Figure 9.

From the part A, i.e. basal part of the pseudostem, twenty-two pieces of pseudostem were obtained. After removing the water in the cell-like structure of the each pseudostem, they weighed 39.55 kg which is estimated to about 50 to 60 % of the total fresh weight of the part A.

The part A was then processed into 26.75 kg of shakicha washi to which the gooda from the part B (12.06 kg) and the laada from the part C (2.85 kg) were added.

In the total of 41.65 kg (A+B+C) was to be consumed as washi. The remaining part D, which is a combined part of mosa (in a strict sense) and tudi, weighed 5.35 kg and is usually consumed as mosa, otherwise processed into shakicha washi. The mosa part is usually consumed up at once within a day.

Totally 47.0 kg (41.65+5.35) of edible portion can be obtained from one ensete plant.

6-1-3-2. The rate of consumption of ensete

The given ensete was consumed up in nine meals at the homestead of Mr M.W., one of which was eaten as mosa and the others were as washi. It is estimated that the amount of pre-fermented washi in one meal weighs about five kilograms which was decreased to 3.4 kg in average due to the loss of water after fermentation. One meal of washi is cooked for about four to six persons (five in the average) Baked washi for one person is about 600 to 800 g (500 g in

the average) This indicates that one ensete plant can feed about 45 (9x5) persons at one time if cooked at once.

The total energy from 100 g of fermented ensete starch is known as 186+28 kcal (Argen and Gibson, 1968;5) So, it is expected that at the homestead of Mr. M.W., one person can get between 1,100 and 1,400 kcal in one meal.

Based on the figures obtained above, rough estimate can be made and shown that approximately eight ensete plants of three years old kaksa can feed one person for one year if he eats ensete food once a day.

$$365 \text{ person times} / 5 \text{ persons} / 9 \text{ times} = 8.1$$

6-1-3-3. Land requirements and planting density

Suppose one adult man should consume eight ensete plants in a year, how large the land necessary for ensete cultivation is ?

The average distance of twenty-seven ensete plants which were growing in the tika haami of the homestead of Mr. M.W. was found to be 220 cm between each other
Theoretically, at minimum the area of 33.5 m^2 is necessary for planting eight ensete plants with the distance of 220 cm each (Figure 10) Furthermore, the area which are six times as large as that should be required if they will grow up to mature in six years.

$$33.5 \times 6 = 201.0 \text{ m}^2$$

It is naturally understood that this figure should be

over-estimated because the ensete seedlings are more densely planted in their early stage of growth. Nevertheless, the figure is much less than that of Simmonds (1958), in which he estimated as 607 square meters (0.15 acre) in the case of Sidamo area of southern Ethiopia.

The actual field area under ensete cultivation in the homestead of M.W. was 1364 square meters in which 274 ensete plants, excluding seedling (artsi stage), were grown. Among them, 134 individual plants were at the stage to be ready for processing.

The average density of ensete plants in the field is;
 $274 / 1364 = 0.20$ (plants / square meters)

This figure is still less than that obtained from the previous estimate of consumption;

$8 / 33.5 = 0.24$ (plants / square meters)

This shows that the ensete field of M.W. is more scarcely planted than the estimate.

6-1-3-4. Carrying capacity of ensete

Ari people should not be considered to live entirely depending on the ensete. However, if so, how large the population can be fed by the ensete in the Ari land ?

Following is the rough estimates of carrying capacity of the ensete fields of the homestead of Mr M.W., assuming that one adult gets the energy of 3000 kcal per day entirely from the ensete food. However, it should be noted that the

amount of protein is not enough if they live on ensete food alone. One hundred grams of washi normally contains only 0.9 g of protein (Ethiopian Nutrition Institute, 1980:80).

In order to get 3,000 kcal per person in a day, 18.7 ensete plants are necessary which is based on the previous estimate.

$$8.1 \text{ (ensete/year)} \times 3,000 / 1,300 = 18.7 \text{ (ensete/year)}$$

If we assume the six years-cycle continuous cultivation under same planting density in the M.W.'s field, the present ensete plants can sustain about 2.4 persons for one year.

$$274 \text{ plants} / (18.7 \times 6) = 2.4 \text{ (person/year)}$$

The actual carrying capacity should consider the land used pattern and the cultivable land area. The simple estimates drawn above reveal that the ensete fields of 1 km² large can support over 2,000 souls.

$$10^6 \times 0.24 / (18.7 \times 6) = 2139$$

Under normal circumstances, there should be uncultivable land such as swamp, river bank and steep hillside, and the field of other crops. Even if the area suitable for ensete cultivation is only 10 % of the total area, the Ari land still can sustain 213.9 persons per 1 km² which is much larger than the actual population density of the area, about 80 persons/ km² (The estimate of Ari population is approximately 130,000 persons. Total area is about 1,500 km²)

6-2. The importance of ensete in the daily diet of the Ari

How often do the Ari people take ensete-food in their daily diet ? We, however, have not yet had enough statistical data on the daily diet of the Ari nor of the other ensete eaters in Ethiopia. Therefore, I found it critical to record the daily diet of individual homesteads with substantial qualities as well as with considerable quantities in order to assess the importance of ensete in the Ari's diet.

All of the 14 sixth-year-students of Metsar Primary School were chosen as the sample population of the survey and considered to be representing the Ari population in the realm of the Sida chief (baabi) After several times of preliminary survey, main comprehensive survey by way of recording the food-diary is conducted for one week from 1st January. to 7th January. 1986.

Students usually go to school after breakfast and coming home for lunch. Those who stay near the school come home for lunch and go back to school if they have classes in the afternoon. Others from the village far from school may bring lunch boxes. Even if they do not bring food from home, they share the lunch or sometimes school teachers provide foods for them. They normally have supper with their family at home.

In this paper it is only focused on the importance of ensete in their daily food intake. The detailed analysis of

the diet of the Ari will be appeared in the other paper (Shigeta, 1988, in press)

A simple blank notebook and a ball-point pen were given to the each students and they were asked to record whatever they eat daily. They were requested to write down when, where and with whom they had meal in Ari language using Amharic characters

From the result of preliminary survey, it was found that the students regularly have their meal with their family members such as their father, mother, brothers and sisters and they eat same dishes with those of the same sex. Therefore, we can consider the food diary data from 14 students as representing the cases of daily meals of 14 homesteads among the Ari families in the area. Not only the name of the recipes but also its source materials were also asked to record. For example, when tiima which is the name of the boiled cereals or beans, is recorded, its original materials such as broad bean, pea and wheat are also recorded.

When we counted up these materials used in different dishes, a total of 640 items were found in the meals of one week. Normally Ari people take meals three times a day, it is calculated that in the average, about 2.2 items of different food were eaten at one meal as shown in the calculation below.

$$640 \text{ items} / (14 \text{ persons} \times 3 \text{ times} \times 7 \text{ days}) = 2.18$$

Figure 11 shows the frequency distribution of different

materials of food appeared in the survey. Items are also classified according to the folk classification of the cultivated plants by the Ari. "Others" include animal food such as milk, meat, and beverage such as tea, coffee and distilled liquor. But the gola, thick alcoholic drink made from grain is included in the ishin.

Among the 640 items, 242 (37.8%) can be classified as ishin and 283 (44.2%) as tika. Two third of the items classified as tika were root crops such as ensete, taro and yam. Ensete holds only 10.5% (67 items). When the Ari people are asked what kinds of food they take, in the first place they usually answer to the question by referring the name of the two categories of food, i.e. ishin and tika. When they say that they had tika, the answer usually has such a connotation that they had no time to prepare proper food or they had the food previously cooked.

As mentioned earlier, ensete crop has a great deal of potential as sustainable food resources of the Ari. However, we can conclude that ensete food plays a limited role for the actual diet of the Ari.

The recording of the diary was performed in the dry season when harvesting of the ishin crop, cereals and pulses, are at the highest peak. In the wet season when other crops are not abundantly available, the importance of ensete should increase to much extent. The results of the survey also done in the area at about 1600 m above sea level, revealed that the higher the altitude is, the more

the importance of the ensete in the diet of the people becomes.

6-3. The importance of fermented ensete products in the periodical barter markets in the Ari area

The location of the periodical markets in the Ari area that I visited for the investigation of barter exchange of ensete products with other commodities is shown in Figure 12. Most of the market places are characteristically located along the border area (approx. 1,600 m above sea level) between the highland called dizi and the lowland, dawla.

The main feature of the Ari's barter markets can be summarized as follows:

(1) Dealings in the markets are mainly barter exchanges without monetary deal.

(2) Fermented ensete products from the highland, dizi, are exchanged with fresh coffee leaves from lowlands.

(3) Only the women deal with the ensete in the markets.

(4) Ensete products such as washi and mosa are bought (exchanged) at the markets for domestic consumption.

Washi from the highland, dizi-washi, is regarded as precious food and sought after especially at the barter market of lowland. The units of exchange at the highland markets were ranging from 800 grams to one kilograms. On the other hand, those of the lowland are merely 400 to 600

grams. The amounts of coffee leaves exchanged with washi decreases as the altitude of market places go higher

People strongly prefer to have the washi from highland at the market even though they know very well that at the lowland the ensete plants can be cultivated, grown quickly and processed into washi. This attitude of people towards highland washi is partly because of the fact that lowland washi cannot last for longer period and get over-fermented and rotten quickly. The tastes of over-fermented washi is expressed in the Ari's terminology as charmi; strong taste, tsorkumi; very strong taste, and shogomi; rotten smelling. Contrary to such lowland washi, the highland washi will take longer period of time for fermentation from several months to nearly a year, which is believed to give a good taste; lokomi.

Not only the ensete products but also other commodities are brought to the market. At the harvesting season of other crops such as cereals and pulse crops, it was observed that the relative amount of ensete products should relatively decrease to some extent.

The statistical data on the market deal were taken at the Metsar market (1,600 m above sea level). on 30th January, 1986. The number of the market attendants and the content of their baggage were recorded at the four entrances of the markets. After several times of sampling tests previously conducted, it is concluded that two entrances are normally opened for highlanders but the other two are for

lowlanders. On the day of data collection, among the 954 persons who came from lowland, 585 were women whose main objective was to get highland washi. In the total of 1,870 attendants of the market, 44 women (2.4 %) were found bringing ensete corms and/or fermented washi for exchange or selling. In the other survey in the same market place, among 87 women randomly chosen, eleven women were exchanging/selling ensete.

According to the sampling measurement of baggage of several women, one woman could carry an average of 20 kg of washi to the market on her back. This washi was divided and shaped to small balls of about 500 g each. The average number of washi-balls bought by the buyer was usually two to three. Here the rough estimate can show that one seller can sell reasonable number of washi balls to the 16 buyers ($20,000/500/2.5=16$)

If we could estimate that all of 44 ensete sellers had sold her washi out, the total of 704 (44×16) buyers are thought to have bought washi. This estimation may explain the fact that most of all the women from lowland (counted as 585) could be provided with highland washi.

The fermented ensete products, washi, is such a highly esteemed food stuff which is strongly sought after in the markets. Shigeta (1988) discussed on the detailed account on the barter markets in the Ari area. The ecological as well as sociological significance of the barter markets among the Ari society will be mentioned in the other paper.

CHAPTER VII

LANDRACES OF ENSETE: ITS COGNITION AND VARIATIONS

7-1. Cognition of ensete landraces

7-1-1. Cognition of ensete landraces by vernacular names

As stated in the previous chapter, it is very important to note that the Ari people classify the cultivated ensete as agemi but, on the other hand, the wild one as gela of which the name is also applied to the seedlings spontaneously growing in the garden.

Ari people recognize not only the difference between the wild and cultivated ensete but also designate different varieties among cultivated ensete one by one. The varieties of cultivated ensete are classified by the Ari people according to the characteristics, and each variety has its own name in Ari language.

In order to distinguish such variety from so-called "variety" in the conventional classification of cultivated plants, I prefer to use the term "landraces" which is a unit of grouping cultivated ensete plants distinguished by common

characteristics and called IT by the specific vernacular name.

I have recorded more than one hundred vernacular names of cultivated ensete. Among them, 78 names could be identified as representing distinguishable landraces, after excluding those names which can be synonyms or identical as their derivative forms of other landrace names found in different geographical areas and dialects.

I have asked to informants to list up all the names of ensete landraces. Interviews were made individually avoiding any influences from others. When the informant listed the same landrace name more than twice in one trial, the second as well as the latter ones were not counted. During the interview, I did not give any information, unless asked so, whether the informants answered the same name of landraces more than twice or not. Therefore, it can not be immediately concluded that the informant does not know a particular landrace even if he has not named it.

By this way of examination, the number of landrace recognized by the informants should tend always to be underestimated compared to the actual figure of landrace cognition in their daily life. The informant tend to give more numbers of landrace names when they are asked to list up landrace names in their own garden than those asked in the isolated examination room.

The other test was also tried by using the check list of the ensete vernacular names already known by myself

However, by this test, people always tend to answer more affirmatively since they have a kind of feeling that to have more different kinds of landraces in the garden is more prestigious. Moreover, in this test method it was practically impossible to confirm whether the informant truly knows his landraces or not.

Table 7 shows the frequency distribution of, and its order of, ensete landraces recognized by 39 informants. In the left most column of Table 7, the names of landraces are shown in descending order of their frequency mentioned by 39 informants. The number in the central column shows the order of respective landrace mentioned by the informant. For example, the informant No.31 mentioned the landrace gena first, and buguni second, karta third, and so forth. The total number of landraces mentioned by each informant is listed in the last row of this table.

In the right-most three columns indicate the frequency of each landrace referred by the informants, the sum of the number of referred order in each landrace, and its average, respectively.

Thirty-nine informants referred to 71 different landrace names, and 298 names in total (Table 7). The lowest was one (Informant No.12), while the highest was 21 (Informant No. 31). The average number of landraces referred by the informants was 7.6. The mode of frequency was between five and six landraces.

The highest frequency of reference was recorded on gena

landrace to which 27 informants, among 39, were referred. The second is joolak, following karta, kaksa, and mooset in descending order. Interesting point is that merely ten landraces were referred by more than ten informants. And only 16 landraces were referred by more than five informants. The remaining 55 landraces were mentioned by only one to four informants. Twenty-seven landraces (38 % of total number) were referred by only one informant.

It is noteworthy that among the Ari, popular landraces amount to ten, and the others are only known to a few people.

7-1-2. Geographical differences of ensete landrace cognition

7-1-2-1. Lowland

In this section, geographical differences of the cognition of ensete landrace will be analyzed by rearranging the data obtained in the previous examination according to the folk classification of the environment by the Ari people.

In the lowland, dawla, the data were obtained from three traditional territories of local chiefs.

In the territory of Sida chief (Figure 5), Sida baabi, 22 informants gave 36 different landrace names, in total of

116 names, 5.3 names per person in the average. The minimum number of landrace names referred was one, and that of the maximum was eleven. Among the landrace names referred, kaksa, garecha, gena, and joolak, were the best five referred by more than the half of the people asked. Four landraces names were referred by more than five persons, while eight names were mentioned by less than five but over two persons. Among the 36 landrace names, twenty names were only referred by one person.

In the territory of Biya chief (Figure 5), Biya haabi, three informants mentioned 13 names, in total of 20 names, among which gena and kaksa were referred by all of three informants. But eight names were only mentioned by one informant.

In the territory of Baka chief (Figure 5), Baka haabi, the situation is almost as same as that of Biya. Three informants gave 32 names in total. Among the 32 names, half of the names were only referred by one informant. To the contrary, only two names, gufalak and mooset, were referred by all the three informants.

Table 8 shows the best five or six landrace names which referred with high frequency by the people residing in the respective geographical area of the chief's territory. In the lowland, the landrace names which were referred with high frequency are common in all the three territories, i.e. kaksa, gena, and mooset. But the number of landrace names which were referred by only one informant was also commonly

high in the all three areas.

7-1-2-2. Highland

In the highland area called dizi, where the altitude is more than 1,600 m to 1,800 m above sea level, the total of 113 landrace names were answered by ten informants. In the average, 11.3 landrace names were given by each informant which was comparatively higher than those of lowland.

Among the 52 different names, gena was the only one that were referred by all the informants. Only six names including gena, karta, daakai, joolak, maga, and mooset, were referred by more than half of the informants. On the other hand, there are 30 different names that are referred by only one informant and that is amount to more than half of the landrace names.

It is interesting to note that the kaksa is found only in the lowland of Sida and Biya but not in the highland. Ari people also admit the fact that kaksa is only found in the lowland.

The results can be summarized as follows:

- (1) Only five to six landrace names were widely known to the people of all the territories.
- (2) The majority of the landraces were only known to the much limited group of the person or the individuals.
- (3) Clear difference between highland and lowland with regard to the landrace names cannot be found, except two to

three names. Many landrace names are rather common in both areas.

7-1-3. Difference of the landraces cognition according to the age and sex

Table 9 shows the data obtained from 22 informants of Sida chief's territory. Data are arranged according to their age, i.e., from left to right, the age of the informant increases. And the names of the landraces are arranged in the order of high frequencies of references from the top to the end.

In terms of the number of landrace names referred, there seems to be no significant difference among different age groups. The Informant No.38 who is seven years old, gave exceptionally many names ($n=11$). However, there was no significant correlations between the age and the number of the landrace names answered ($r=-0.018$). Therefore, it is concluded that regardless the age, people know several famous landrace names as well as a few rare names.

Since only a few data were obtained from women informants, it might not be appropriate to judge the sexual difference in the landrace recognition of ensete. However, as far as the present data show, there is no such tendency that only the women know certain special landrace names. (Informant Nos. 20, 23 42 were women and underlined

in Table 9.)

As stated in Chapter 4, among the Ari, propagation and trans-planting were mainly done by men. Women mainly engage in the harvesting, processing and cooking of ensete. However, both women and men keep close contact with the important aspects, of the life cycle of ensete. Some agricultural activities such as weeding, thinning leaves etc. are done by both sexes.

Thus, all the results may suggest that there would be no much difference in their landrace cognition in terms of their age and sex. This also implies that the knowledge on ensete cultivation which is deadly important to the Ari's way of living, should widely and rather evenly distributed in their society regardless of the age and sex.

7-1-4. The process of the learning of landrace cognition

It is a common scenery that girls of five to six years old are helping or imitating their mothers' works in the ensete field, such as cutting, processing and cooking preparation. Both boys and girls become to help their parents or even to engage in the agricultural activities by themselves in their age of five to six. It is likely that the Ari children get acquainted with various knowledge on ensete such as landrace names, propagation, differential characteristics, method of processing, etc. through the

observation and daily activities in the households.

Table 10 is to explain when the children start acquiring such knowledge on ensete. Eleven students of Metsar Primary School in their sixth grade were asked to list up all the landrace names as many as they know. The age of the students ranged from 12 to 18 years. There was only one girl student (Informant No. 6)

The students gave 49 names in total, and about 4.5 names per person in the average. The minimum number of landrace names referred was two, on the other hand the maximum was eight.

Table 10 indicates that the overall tendencies do not show much differences from the results obtained from Table 7. When they are asked where they learned the names of ensete landraces listed, Most of them acknowledged that they learned at home with the names of ensete plants actually planted in their home garden, tika haami.

Usually, an Ari man at his age of 15 to 18 years gets married, become independent from their parents and build his own house. Girls get married at the age of 13 to 16 years. Sixth grade students of primary school, who sometimes drop out the school because of their marriage, should have complete knowledge on ensete landrace cognition comparable to that of aged Ari people.

7-1-5. Meaning of the landrace names, and their etymology

The etymologies of the many landraces are presently not known to the Ari people. Among the 78 names recorded, only 18 were revealed to have certain meanings as listed in Table 11. It is noteworthy that the meanings of most of the famous landraces names were not known.

Five names are derived from the wild plants names, while six are traced to the kinds or tastes of food.

For example, tsala is originally the local name of Arisaema sp. of which way of processing is very much resembling to that of ensete. Zergi means "wheat", and people explain that this name came from similar tastes of real wheat and ensete-"wheat". Other landrace names carry the names of location, way of propagation, personal name and so on.

The explanations of the etymology of ensete landrace names are neither consistent nor stable among different informants. Some informants explained the landrace name oisi which means bamboo, because the ensete-oisi grows as quickly as the real bamboo does. However, many others could not give clear explanations why the ensete "bamboo" is called as oisi. Similar tendencies can be seen in the ensete landrace names which are the same or related to food.

I understand this situation at the rather conservative position in interpreting the origin of the individual ensete landrace names. This is because I observed several cases

that people are to easily change their etymological explanation of landrace names according to the context of discussion. It may be safe to point out that the vernacular landrace names are mere labels of distinguishable groups of plants.

7-2. Differential characteristics of the landraces as a criteria of cognition

7-2-1. Cognition of Individual plants

The importance of landrace names as labels of identification cannot be separately discussed from the fact that how people are giving the names by recognizing the characteristics of each landraces. In other words, it is important to find out what kind of characteristics they are based in order to identify the plant groups by landrace names.

In the case of cultivated ensete, the various characteristics of ensete plants per se are the focus of the identification. In this sense, to regard the landrace name as the "mere labels" might be misleading. Because the naming towards the discrete populations such as cultivated ensete should be totally different from the labeling to the color categories, which are essentially continual in its nature. Therefore, it is necessary to categorize color

spectra before naming them as Leneberg (1967) denoted that the naming of color categories is a secondary process of cognition. However, person's recognition of plants begin with the cognition towards the varied discontinuous characteristics of the plant population.

And in the case of ensete, there are such occasions that the cognition of ensete by people is almost equal to, and done at the same time with, the naming to the group of plants. Of course, there might be the cases of cognition without namings, but it should be remembered that it is exceptional in the Ari-ensete relationships.

Under such circumstances, the Ari-ensete case of identification can be best explained by the analogy of the human face-to-face relationships. People identify individual ensete plant in their field as if they remember the individual person by his/her name. So in this case the landrace name is a kind of proper nouns.

Identification of the individual ensete plants is also made easier by the fact that Ari people would thoroughly take care of the ensete plants in their garden from the beginning to the end of their life cycle. Through such an intimate relationship with ensete, people can remember many landrace names. It may be plausible to assume that the rare landrace names are preserved through this manner of identification.

7-2-2. Identification of landraces through analogy

The other and ordinary role of landrace name is, of course, to be a kind of labels of classificatory system for identification. People can recognize the variation of ensete population according to their classificatory system and judge or select the necessary perceptual variations from overall variations. As a result of this conceptualization of variation (or the process of recognition) a specific landrace name is chosen from the repertory of existing landrace names. Compared to the face-to-face identification, this mode of landrace identification is done through the analogy i.e., the comparison of the similarity in several different characteristics.

Table 12 lists the fourteen landrace names with their characteristics that are popular among the Dumtseter village people. Eight characteristics of ensete as the criteria of their classification are also listed in Table 13.

Pigmentation on the plant bodies is always among the first that people recognize as an important characteristic for the identification of landrace name. Characteristics of the second importance varies depending on the landrace. These characteristics employed for identification can be grouped into three groups:

- (1) Some morphological characteristics which can be observed as the outer appearance.

- (2) Characteristics which cannot be observed as outer

appearance and can be recognized through the long period of observation, i.e., those related to the life cycle and the way of propagation.

(3) Characteristics which are directly related to the utilization of ensete such as the usage and taste.

Because the Ari people can identify the landrace name, to much extent, by using the first group of characteristics through analogy, one can pick up the landrace at his first glance even in an unfamiliar garden. By adding the information from the second and third group of characteristics, the identification becomes more correct.

I do not deny the possibilities that this way of identification should also be employed in the case of face-to-face type of identification. Even if a landrace name of the ensete plant is given by someone as self-evident, he would list up the three groups of characteristics in this order when he is asked the reason why he could judge so.

Figure 13 illustrates a case of Ari's classificatory system of identification. This scheme is deliberately constructed by myself in the form of bifurcate key-table. The order of the characteristics reflects those mentioned by the Ari farmers as much as possible. However, it is apparent that Table 12 contains far more information than Figure 13, and it does not necessarily mean that everyone completely follows the same method of identification shown in this figure. Therefore, although Figure 13 is complete and correct for the Ari people at each branching point, one

may sometimes fail to identify certain landraces.

Most probably, they may reach to the right answer by using the first group of characteristics. Their way of recognition should be something like pattern recognition. Or, they should identify the specific characteristics and make stratification among them just at a glance.

7-2-3. Landrace groups

Popular landraces are usually identified by the second and third groups of characteristics. This is particularly true in the case of landraces that have specific usage. These usage-specialized landraces can be categorized into three groups:

(1) Washi group: Specialized in the usage as washi (fermented ensete) processing. Gena is a representative landrace of this group.

(2) Mosa group: Specialized in the usage as mosa cooking, i.e., boiled corm and basal parts of pseudostem. Mooset and maga are two representatives.

(3) Kala group: Specialized in the usage of kala (leaves) as wrapping and other purposes. Intada is the best example of this group.

This landraces grouping is completely based on my deliberate effort while the Ari people do not clearly claim the existence of three different groups of ensete. This may

be evidenced by the fact that all the representative landraces listed above can be utilized for all the purposes without any kind of biological as well as cultural restriction, and also that all the three groups has no collective names. For example, to eat the small corms of intada which is usually cultivated for the leaves is logically no harm for the people although they dare not to do so.

However, people clearly recognize these three distinctive characteristics as important ones, and remember them in relation to the landrace names. So the information of "tasty" ensete can be inherited not directly through its reproductive organ, but indirectly through the memory coded by the name of landrace even if the ensete is eaten up. Maintenance of landraces by the Ari through the recognition of three groups of distinctive characteristics must play not a dismissible role as a sort of important selective force in forming the real landrace groups in a long run.

For example, the gena is believed to be the specialized ensete landrace for processing washi. The basal parts of the pseudostem are huge enough to increase the total yield of fermented washi. On the other hand, the corm part is relatively small and fibrous, therefore it does not fit for the consumption as food.

Concerning the landraces of mosa group, such as maga, mooset, and alaka, the tastes of boiled corm is the first concern with people and the starch yield from pseudostem is

rather low.

The landrace called kaksa is well known for the easy-to-be-torn leaves. Leaves of this landrace cannot be appreciated for actual usage. The landrace can be seen as a case of negative specialization of the third group: kala group.

Intada can be said as a most typical landrace of kala group. As explained in the previous chapters, the ensete is a monocarpic crop which only gives flowers and seeds at the end of its very long life cycle. Ordinary ensete does not give suckers while banana does. However, the intada is an exceptional landrace which produces suckers (side buds) before it flowers. Intada literally means that it grows by itself. It is a very interesting landrace that lost the apical dominance. Being different from all the other ensete landraces, the mode of propagation of intada is just like Musa banana. Intada has neither been described taxonomically nor reported in the literatures.

We should not overlook the fact that such a landrace like intada is firmly maintained by the people even though it is only effectively useful as a leaf producer for various purposes. The existence of the intada must be sustained by the fact that the ensete is a multi-purpose crop of which most parts are thoroughly utilized not only as food but also as material cultures.

7-3. Variation of ensete

7-3-1. Genetic identity of ensete landrace

In the previous chapter, it was tacitly presupposed that the ensete population has enough genetic variation to be recognized and classified into "landraces" by the Ari people. Before taking this point into consideration, it should be made clear whether the so-called landrace is really a botanical, or even genetically, uniform entity or not. One may claim that the Ari people inaccurately mention the vernacular names at their will. Actually it might be natural to presume so because most of the landrace names are only shared among a few people.

At the earlier stage of the investigation, I had also doubted if there were any inconsistencies in their genetic identity with landrace. However, this doubt has been completely cleared off in the following reasons:

(1) Vegetative propagation of ensete always ensures the genetic identity between the parent and its offspring. More than two hundred clonal seedlings are obtained by this method.

(2) People are thoroughly informed each other of the characteristics and the vernacular names of the landrace when they process the corm of ensete in order to produce seedlings for propagation.

(3) Throughout the process of propagation,

transplanting, and other husbandry activities as well as utilization, the vernacular names are always referred by the people.

(4) When they exchange the seedlings or make them gifts to the relatives or friends, they always mention the name and often the place of origin.

Furthermore, since the ensete has such a long life cycle of three to eight years, they have much chance of being exposed to the people's sight for a long period of time. And the ensete garden, tika haami is just surrounding the house where people spend their daily life. Then, the people not only have much chances of learning the name of individual ensete through daily conversation, but also have so much intimacy with ensete through daily association with, and their proximity to, ensete plants in tika. They often know the vernacular name as well as the life history of individual ensete plant.

All these evidences suggest that the Ari people should name the particular entity of ensete, which holds the genetic uniformity, as a landrace. In this manner, the Ari people conserve both of the landrace and its name. I have called this way of maintaining the landraces as the "folk conservation" of ensete landraces (Shigeta, 1987b)

However, there have been very few studies on the genetics of ensete mainly because its life cycle is too long to obtain tangible data. So far, only an Ethiopian agronomist have tried to analyze the quantitative difference

of yield between the two ensete varieties (Bezuneh, 1984:113-4)

Figure 14 shows the relationships between the leaf length to pseudostem length ratio (abscissa) and the leaf width (ordinate) of four different landraces, mooset, joolak, kaksa, and salta. For the measurement of characters, four plants of each landrace which are in the same growing stage, were selected. And three pseudostems with leaves were removed from individual plants. The length of each pseudostem and leaf, and the maximum leaf width were measured.

Three landraces, except mooset, were rather difficult to distinguish from each other by the color and its pattern of the midrib. Both joolak and kaksa were looked much similar in their color pattern, leaf width, and their overall outlooks. But the kaksa was clearly distinguished from the others by the character that the leaves were more prone to be torn than the other landraces. Salta looks very different in its overall outlooks. Only mooset had fine red stripes on the pseudostems.

All these diagnostic characteristics of ensete landraces may contribute for their easy identification by the Ari people.

However, the peculiarity of the landrace cannot necessarily avoid the case of synonymous landrace names in that different names are given to the genetically identical populations. Also there would possibly be the case that the

same name is given to the two genetically different populations.

The first case may most probably occurred among the rare landrace names which are known to a very few people. In some cases, people themselves should realize the synonymous landrace names. For example, some people explain that these three names, lusakk, oosade, and maga are synonymous but currently used in three different areas, Laida, Sida, and Wuba, respectively.

At the present moment, there is no effective way of solving the problems of genetic identities. Although it does not mean such an attempt is impossible, it is extremely difficult or costly and takes longer time to make rigid examination of the characteristics of ensete by conventional methods under present circumstances. It is practically impossible to identify the synonymity of two individual plants separately growing in distant locations and logically doubtful if one can judge the synonymity by cursory examination of morphological characteristics.

Therefore, for the time being, we should estimate the genetic identity of ensete landraces, firstly, by the comparison of measurable morphological characteristics which are very rough, and secondly, by the people's information which are based on their long experience of cultivation of ensete. In all the available evidences, though circumstantial, taking into consideration, there is no reason why we should not follow the people's identification

as a tangible advantages.

7-3-2. Diversities in the cultivated population of ensete

The Ari farmers can usually have a knowledge of as many as twenty or more vernacular ensete names. However, the numbers of landraces which each farmer knows were usually more than that of the landraces actually planted in their own tika haami. This is mainly because the people have a sort of feeling that having as many kinds as well as numerous ensete plants in their own field is more prestigious.

The list of landraces shown in Table 14 indicates that two informants (Mr. E.S and Mr. M.W.) know more names of ensete landrace than they cultivate in their own fields. For example, Informant Mr. E.S. are planting only five landraces in his field but he is acquainted with additional seven names of ensete which he does not have them in his field at the moment.

Figure 15 illustrates the relative planting position of 27 plants including 10 landraces in Mr. M.W.'s ensete field. The spatial arrangement of the individual ensete plants in the tika haami has no special rules, rather they are planted at random. This is a typical example of mixed cropping patterns in this area. Ensete plants are rarely planted in line, and the same landraces, not more than three, are

seldom grouped in one place as shown in Figure 15.

All these facts may attest to the general tendency of the Ari people who seek the more diversity of ensete landraces. It is their hope that the landrace names should increase as a indicator of diversity. Their sophisticated method of vegetative propagation, which can produce more than 200 offsprings at one time, ensure the process of increasing diversity, or at least prevent the loss of landrace.

In order to analyze the local variation of landrace diversities as well as that of individual gardens, further data collection and more detailed analysis are needed.

7-3-3. Diversity in the wild ensete

It should be more difficult to access the degree of variation in the wild ensete than in the cultivated population. There is no practical way of examining the observable variation and may be meaningless to measure the morphological characteristics for quantitative comparison since their growth stage are not known in the wild population. But in the qualitative characteristics, there are considerable variation among the wild populations.

However, I observed 48 wild ensete plants selected from 300 to 600 plants growing in the natural habitats located at 2 km south of Dumtseter village. Among the 48 plants, 22

had red pigmentation on the pseudostem, while eight had yellow to green stems without red pigment. Leaves of three plants were easily torn showing kaksa-like characteristics. Among the observed plants, no plants showed intada-like way of propagation with suckers.

It should also be noted that the wild ensete are entirely propagated by seeds. Therefore it may be plausible to assume that there are, to a certain extent, variations, if genetic, among the wild populations.

The Ari people call the wild ensete as gela and protect their specific populations ritually. In due course of this conservational effort, attention is also paid to the variation among the gela. They are well aware of several different "landraces" in wild ensete. They call them as wild-kaksa, and wild-gena and so forth. More than ten landrace names were referred as those found among the wild ensete populations. All these names were the same as those of cultivated ensete. So their recognition of variations in the wild population is mostly based on the response to the cultivated populations.

Although gela, wild ensete, is not equal to cultivated one, agemi, it is thought to be identical in terms of the landrace names. And there is particularly a special case that the wild ensete transformed into cultivated one. This process of transformation will be discussed in the next chapter.

CHAPTER VIII

DISCUSSION AND CONCLUSION

8-1. Ethnobotanical significance of ensete agriculture

8-1-1. Domestication process of ensete

The present cultivation of ensete as a food crop is confined within southwestern Ethiopia. The sophisticated method of propagation and multipurpose utilization of ensete are mostly shared by the Ethiopian agriculturalists who are linguistically classified as Omotic and Cushitic with one exception of Semitic people, i.e. the Gurage. However, ensete is most intensively cultivated in the South Omo Province where this study was made, in terms of the area under cultivation and peoples' dependence on the crop. And the wild populations of ensete are commonly distributed in the study area of relatively lower altitude (below 1,600 m). All these facts and evidences, though circumstantial, suggest the possibilities that ensete was first domesticated by Omotic people somewhere in the southwestern Ethiopia.

Yet we do not have any archaeological evidences to determine the date of incipient cultivation of ensete.

Since the seeds of ensete have rather hard seed coat, it could be possible to find out their archaeological traces and artifacts related to the ensete cultivation (Brandt, 1984)

In this study, I observed the case that the real seedling of ensete was intentionally brought into cultivation. However, these seedlings had been termed as wild ensete until they were recognized as one of distinct landraces. It must be also noted that the people never utilize the wild ensete for food.

These findings revealed that among the Ari people, there are obviously cultural, if not biological, distinction between wild and cultivated ensete. At the same time, they do recognize the transformation of ensete from the wild ones to the cultivated ones. Although it is doubtless that the people were exploiting wild ensete at the beginning phase of domestication, we do not yet know how they started the ensete cultivation. Followings are hypothetical process towards the incipient ensete cultivation:

- (1) Exploitation of wild ensete growing spontaneously.
- (2) Shifting the residence to the nearby spontaneous populations and exploiting them.
- (3) In the course of exploitation of wild population, people unintentionally disturb the surrounding vegetation that favors the growth of wild ensete.
- (4) Transplanting true seedlings of wild ensete to the gap within the spontaneous habitat.

(5) Findings of the vegetative method of propagation through the observation of adventitious buds which were accidentally induced by the damage to the apical growing point of the wild ensete.

(6) Intentional transplanting of induced buds to the more convenient residential places such as forest clearings.

8-1-2. Ensete as a typical multipurpose crop in Africa

Multipurpose utilization of ensete is a direct reflection of the people's big concern with this plant. People's interest do not remain only in the practical usage of the ensete but is also extended to their aesthetical viewpoints as will be discussed in the next chapter. However, I can also point out the materialistic conditions or characteristics of the multipurpose utilization of ensete as follows:

- (1) Abundantly available.
- (2) Available throughout a year.
- (3) Easily obtainable.
- (4) Ready to be utilized after simple workings (except for the processing of fermented starch)

Some of these characteristics are common to other multipurpose crops of Africa such as sorghum (Sorghum bicolor Moench), baobab (Adansonia digitata L.) and tamarind (Tamarindus indica L.) However, ensete is unique and

typical in having all these three characteristics. The other three crops are not bestowed all the four characteristics listed above.

If I add one more characteristics of multipurpose utilization of ensete, it is the disposability or short-term durability of ensete products especially as material cultures. However, it should be noted that the fine fiber of ensete pseudostem can be the material for industrial manufacturing.

Multipurpose nature of ensete utilization is also found in the food processing of this crop. Each parts of the corm has its own way of preparation and cooking. And one part has several different ways of processing and recipes.

I could conclude that ensete is one of the most elaborated and sophisticated domesticated of Africa.

8-2. Person-plant relationships in creating new landraces

8-2-1. Origins of diversity of ensete landraces

Genetic diversity of cultivated ensete can be provided directly by either bud mutations occurred in cultivated populations or by introduction of new variations from outside, i.e. from wild populations, or introduction of new landraces from outside of the Ari land. Certain landraces, such as gofa and uba.joolak are in fact known to be of

foreign origin among the Ari.

I have not come across the case of new landraces originating from a bud mutation. However, I have obtained four circumstantial but clear evidences indicating gene flow between wild and cultivated ensete populations (Figure 16).

(1) The wild populations maintain sexual propagation with high frequency of flowering individuals. (2) There are, though rarely, flowering ensete among cultivated populations. (3) There are ritually protected areas of wild ensete population near the village as kaiduma. And, (4) wild ensete is a predominantly out-crossed plant pollinated by insects.

There was an actual case of seed propagated ensete being introduced into cultivated populations. The mother plant was a cultivated one in tika haami. It happened to flower and consequently fruit and finally some of its seeds germinated.

In this case, and in a few similar cases which I indirectly collected the data, the seedling is firstly called gela. The Ari people never remove those seedlings from tika haami but foster them with great care. After a year or so when morphological characteristics become evident to allow identification, the ensete plant is named accordingly to an already known landraces or is said to be given a new name. (Those landrace names with very low frequencies in Table 7 were sometimes explained as originated from the real seeds. But there were no direct

evidence to prove the case.)

At this point, the gela transforms into one of landraces in agemi.

In the case I observed, the naming has not yet been done, but the owner clearly identify its mother plant by the vernacular landrace name. And around this gela plant, there were many seeds in the soil. Since the ensete seeds have hard seed coat and they are often buried into soil for long period of time. Buried seeds must be a kind of seed bank providing genetic diversity to the cultivated ensete population. Once established as a landrace, it is propagated vegetatively as in the same way as other landraces are propagated. This makes it quicker for the landrace to spread and be known to the people. This new ensete is called arfi agemi, literally means "seed ensete" The "seed ensete" is praised for its origin when people are exchanging seedlings with friends or selling ensete products in the periodical barter markets.

8-2-2. Dynamics of creating diversity of landraces

We often endow variety names to the cultivated plants with different variation, and use the names as a signifiant in many cases. As is also evident in the case of rice varieties which Japanese know very well, when we try to 'select' rice varieties, a kind of evaluation is always

needed. The variety, as a signifie, should be always evaluated in terms of certain criteria, such as yield and several kinds of tolerance to the damage.

All would agree with that the connotation of the word "selection" should be to keep better ones and throw worse things out. The word also implies that choosing superior ones among the admixture of various variants.

However, it seems that the attitude of the Ari people towards the ensete landraces when they recognize and classify the ensete plants, do not necessarily fit this concept of selection. The reason is firstly because the Ari people place the primary importance on the characteristics which are not directly related to the practical use. These characteristics are mainly morphological ones related to the outer appearance of ensete plants.

As I described in the previous chapter, in describing and classifying ensete, the characteristics related to the practical use such as taste and usage are only, to the very limited extent, referred in the case of a few popular landraces. To the contrary, most of the other landraces are referred with their outer appearance. And such landraces were known to a relatively few people but had their own vernacular landrace name one by one.

Provided the human beings only recognize the practical use factors in identifying the landrace variation, these landraces should be selected to a few superior ones. And the majority of the inferior landraces must have been

abandoned. If such a way of recognition is the only and the best one, those landraces with no apparent practical use might loose their importance or raison d'être. As a result, all of the vegetatively propagated cultivated plants such as ensete would narrow the range of their genetic variation.

But that is not all true. As a reality, there exists diverse landraces, and the people preserve the minority landraces with no apparent practical usage, giving each of them specific vernacular landrace names. By doing so, the Ari people, though unintentionally, prevent ensete from decreasing the genetic diversity, or the number of landraces.

Their way of recognition also ensure the introduction of new variation found in the wild population into the cultivated one. Although I did not come across the case, the new landrace created by the bud mutation is also, if any, likely to be brought into the cultivated population by giving proper name to it. All in all, the genetic diversity in the population of cultivated ensete can be maintained.

However, it may be appropriate to assume that there actually co-exist two kinds of selection forces placed on the ensete population which pull it to the two different directions at the same time. One is to take them towards the increased diversity of ensete landrace. The other is to reduce them to a few number of landraces.

The cultivated population of ensete can keep its diversity firstly because people recognize not the usage but

the characteristics of outer appearance in order to distinguish landraces, and secondly because there are far more number of such characteristics than the utilitarian traits. Such kinds of human behavior to maintain the diversity of plant populations apparently have the so-called nature of "diversified selection"

The main driving force of this diversified selection should be cognitive human behavior in which people finely observe the plant and name it. I would like to propose here the concept of "cognitive selection" as describing such human behavior that bring the increased diversity to the plant population.

Contrary to the "cognitive selection", "utilitarian selection" is to reflect such human behavior that make the variation decreased and uniform in a long run.

Therefore, I presume that both the cognitive selection and the utilitarian selection should be combined together to be equal to the general terminology, "artificial selection". But, the artificial selection tends to have been regarded as an equivalent to the utilitarian selection since long time ago. In case of indicating such an usage, I will note as "artificial selection in a narrow sense"

The main characteristics of cognitive selection will be listed as follows:

(0) Cognitive selection is a universal phenomena found in the human attitude towards the plants.

(1) The first process of cognitive selection is that

people distinguish perceptible differences of plant population and designate specific names to them. These perceptible differences are the characteristics of outer appearance such as shape, color, size, surface characteristics and so on.

(2) The second process of cognitive selection is the human behavior that sustain the differentiated populations of plants. Cognitive selection does not intend to make the hierarchical stratification of individuals nor the extinction of inferior individuals.

(3) Cognitive selection is, as a result, responsible to realize the diversity in the given population. In this sense, the cognitive selection is synonymous to the diversified selection.

(4) Cognitive selection can be co-existed with the utilitarian selection (artificial selection in a narrow sense) which bring the less diversity and uniformity

(5) Cognitive selection is a prerequisites of utilitarian selection. Utilitarian selection take place just after the cognitive selection.

(6) When all the criteria of cognitive selection are fixedly conjunct with that of utilitarian selection, cognitive selection will cease its function. The variation will converge and the diversity will decrease.

8-2-3. Mechanism of creating diversity of landraces

In summing up, the mechanisms in which the cultivated populations of ensete maintain their diversity can be explained as follows:

(1) Genetic exchange occurs between cultivated and wild populations of ensete.

(2) Bud mutation can be expected in the cultivated populations which are maintained by vegetative propagation.

(3) Some of the wild populations are preserved by the Ari people as the ritual sanctuaries.

(4) The people also give protections to the ensete seedlings grown in tika haami.

(5) Furthermore, method of vegetative propagation should encourage the discovery of bud mutation and the establishment of a new landrace and its getting popularity.

(6) People perform cognitive selection, i.e., cognition of landraces, classification, and naming based on the external distinctiveness among landraces.

(7) And the utilitarian selection pressure may be placed on the ensete landraces on account of their utilitarian value.

All these points are interacted to realize the diversity of ensete landraces.

8-2-4. Diversity of landraces and the Ari's cosmology

I have been emphasizing the role of person-plant relationships for creating and maintaining diversity of ensete landraces. However, I do not necessarily contend that the Ari people intentionally try to diversify the ensete landraces. Ari people rarely refer the merits or significance of the diversity of ensete landraces nor try to interpret the diversity such as the insurance and risk managements.

Do they, in fact, realize any utilitarian importance in the maintenance of the diversity of ensete landraces? I repeatedly pose them the question asking why are they planted so many kinds of ensete landraces in their garden ("Arakan hare haamiru agemi aynet bedumi dokodee?") Their answers were all negative to the questions asking whether they are realizing the utilitarian importance or practical usefulness of the diversity of ensete landraces.

Most of the people said, "To have as many kinds of landraces as possible is conducive (wanna; good, fine, beautiful, tasty)" Or, they insist that the situation is merely conventional and a very old custom which they have been keeping.

It may be possible to ask them again why they are keeping such a custom for so long and why they consider it good to have many landraces. Then, we expect their answer to become purposive ones; cf "because various kinds of

landraces are suitable for several different way of cooking", "they have different taste", "the strength of the leaves and growing period differs each other" and so on. As is repeatedly contended in the previous chapters, the utilitarian selection based on such criteria of practical usefulness of landraces leads consequently towards the decrease of variation.

Diversity of ensete landraces is a reality. Ari people's attitude towards this reality is apparently affirmative. They appreciate the great diversity of ensete landraces in their field. However, their reasoning or the principle of explanation for the diversity of ensete should not necessarily be conjectured as a precondition of the diversity. The diversity as a reality can be most well understood as a kind of non-purposive causality born from the interactions between human beings and plants. Ari's view that appreciates the diversity is firmly sustained by their behavior in which they directly perceive and even create the diversity of ensete landraces, i.e. cognitive selection, but not by the practical usefulness, which is merely one of the results of the diversity.

SUMMARY

The main purpose of this study is to present a comprehensive ethnobotanical description of person-plant relationships from the case study of the ensete (Ensete ventricosum (Welw.) E. E. Cheesman: Musaceae) and the Ari people in the southwestern Ethiopia.

The Ari people, whose population is estimated as approximately 130,000, reside in the South Omo Province located in the southern fringe of the Abyssinian plateau. They are settled agriculturalists and have a great wealth of cultivated plants. In their territory ranging from 700 m to 3,000 m above sea level, they mainly cultivate barley and ensete in the highland, coffee and sorghum in the lowland as one of the important crops. Around the households, ensete, yam, taro, coffee etc. are reared, while in the distant field from home, sorghum, tef, barley. Faba bean, pea, and lentil are cultivated.

Ensete is an endemic crop to the southwestern Ethiopia of which the wild form and related wild species are widely distributed in the central and southern parts of Africa. Under cultivation, ensete is propagated by the artificially induced bud, otherwise the monocarpic ensete will take three to seven years or more until it flowers and bears fruits.

In the research area there are both wild and cultivated population of ensete, however, there are no distinctive differences between the two.

Cultivated ensete, called agemi in the Ari language, usually takes three to seven years to reach its maturity though it can be utilized throughout a year. They are transplanted twice to three times in their life cycle. Seed-propagated wild ensete, called gela, grows along the river and low wet place.

Among the spontaneous habitat of the wild ensete, there are places called kaiduma entering which is strongly tabooed. Such habitat of wild ensete is protected from human disturbance and destruction. Kaiduma is a ritual sanctuary of the wild ensete, although this conservation is unconsciously achieved by the people.

Ensete is a typical multipurpose crop of which every part is thoroughly utilized by the Ari not only as food but also as several material cultures. As a food, fermented pulp of the pseudostem and the underground corm are important. Fermented products of ensete crude starch, called washi, is one of the best favorites of ensete cuisine by the Ari. Cultural materials made from ensete is a sort of disposable tools. Leaves, pseudostem and its fiber are indispensable source of material cultures. Ensete is also important as an animal feed, a cover crop, and a glove enclosing the households.

Being one of staple food among the Ari, it is estimated

that the ensete can sustain 191.2 persons per square kilometers which highly exceeds the actual population density of the Ari area. The dietary survey also revealed that in their actual diet, ensete is less utilized by the Ari people compare to its high potentiality as a staple food. However, people place a primary importance on ensete as their cultivated plants and maintain considerable interests on this crop. For example, it is found that the fermented ensete products brought from the highland of the Ari area are highly esteemed by the people, high in demand, and exchanged with other products such as coffee leaves without using money.

Their keen interest with ensete is also evidenced in their cognition towards the landraces of ensete. In the survey, seventy-eight names could be identified as representing distinguishable landraces. In the research to the thirty-nine informants, twenty-one names was the maximum number of landraces recalled (Average = 7.6, Mode = 5-6). This knowledge was evenly distributed in the society regardless to the age and sex. It is also found that the geographical distribution of most landrace names are rather confined to the small area and only a few landrace names are known throughout the study area. The learning process and the etymology of ensete landrace names were also investigated.

It is suggested that in many cases the Ari people recognize individual ensete plant as if they remember the

individual person's name. However, the identification of landrace names is also done through analogy. Morphological characteristics such as pigmentation which can be observed as the outer appearance of the plant is the first group of characteristics used for identification. Characteristics of the second importance for identification varies depending on the landrace. Three landrace groups were identified according to the specialized usage of different parts of ensete, i.e. washi group, mosa group, and kala group.

The genetic identity of ensete landraces seems to be perfectly maintained among the Ari people through their folk conservational activities. However, there may be some cases of synonymous landrace names. Considerable range of variation were observed both in the wild and cultivated populations of ensete. People are keen to increase the diversity of their ensete garden in terms of the number of landraces.

Based on the observations of the ensete cultivation by the Ari, the process of domestication of ensete was hypothesized. Intentional transplanting of ensete were thought to have started after the findings of vegetative method of propagation by the artificially induced buds.

As a typical multipurpose crop in Africa, ensete is compared to the other African multipurpose crops. It is found that all the four main characteristics of multipurpose utilization were bestowed to ensete, i.e. abundance, non-seasonality, high obtainability, and simplicity of

processing.

The origin of the diversity of ensete landraces was discussed. It is proposed that the "cognitive selection," the categorization of external appearance of plants, plays an indispensable role, in the sense that the new landrace is brought into the repository of landrace diversity. "Cognitive selection" is devoid of value judgment, and therefor, qualitatively different from "utilitarian selection."

Taking the Ari-ensete case as an example, the dynamics and mechanisms of creating diversity of landraces were explained and concluded as a non-causal process of interaction between plants and humans.

ACKNOWLEDGMENTS

This dissertation owes much to a variety of people and institutions both in Japan and in Ethiopia. In the course of this research which was lasted for five years and took me to Africa four times in a total period of about a year, I have had ample opportunities to be benefited from material, moral and emotional supports in addition to their advice and criticism. I thank them all from the bottom of my heart.

First and foremost, I am especially thankful to Professor Sadao Sakamoto, Director of the Plant Germ-plasm Institute, Faculty of Agriculture, Kyoto University, who initiated me the idea of research on ensete in Ethiopia and kindly allow me to participate in the research group on African Agriculture. Had it not been for his insightful comments on the Ensete agriculture and the process of domestication as well, it would not have been possible to undertake such intensive field work with a pointed awareness of the issues. I should be also grateful for his incisive and constructive criticism and comments on the draft of this dissertation.

Dr. Katsuyoshi Fukui, National Museum of Ethnology, Japan, originally introduced me to Africa twelve years ago and again to the Ari people in 1986 which was the real onset

of my research for this dissertation. However, I also owe him for several different aspects on the research, especially on the spirits of field work, from the beginning of my career as an Africanist in the Southern Sudan with Acholi people and in Kenya with Karenjin people. I am deeply grateful for him.

The first and longest field work of mine in Ethiopia was financially supported by the Grant-in-Aid for the Overseas Scientific Research of the Japanese Ministry of Education, Science and Culture (Project No. 61041043). Professor Keiichi Sakamoto, who is presently in the Fukui Prefectural University, was the project leader of the research team organized in the Department of Agricultural Economics, Faculty of Agriculture, Kyoto University. I would like to express my sincere thanks to him for giving me a great chance.

Professor Osamu Soda, and other members of the staff from the Department of Agricultural Economics, Faculty of Agriculture, Kyoto University, were kind enough to help me in many ways during the course of my first field work and gave me suggestive comments in the occasion of research meeting. I thank them all.

Through the field work, I shared with Mr Hiroshi Matsuda and Mr. Yukio Miyawaki, and other colleagues, several kinds of hardship such as the preparation of foods and equipments in Addis Ababa, traveling down to the Omo basin by a humble car, negotiating with the local

administrators, etc. All these experience have now transformed into joyful memory. Many thanks are also due to them all.

The writing-up phase of this work was undertaken in two different places. While the work on the Japanese version was done in the old wooden building of the Plant Germ-plasm Institute at Mozume, the final English one was given moderate time for work during the course of its busy but attractive activities in the Center for African Area Studies (CAAS), Kyoto University. I would like to thank all the colleagues and staffs of the Plant Germ-plasm Institute for their kind assistance. I would also like to appreciate their kind understanding from all the staff of CAAS as well as Professor Jiro Tanaka, Director of the Center. I must also thank the former Director of the CAAS, Professor Junichiro Itani, who retired last year and is presently in Kobe Gakuin University, for his encouragement, and quiet and perceptive comments on my work. I have mounted an impressive debt of gratitude to him.

In Ethiopia, I was helped by a wide variety of people and would like to thank all those who made life easier and joyful in many ways.

Mr. Angaw Megmi has been my best friend, good teacher, efficient assistant and the best supervisor with me from the very beginning of my stay in the Ari people's land.

At Metsar village, all the villagers helped me in many ways. Those who need to be particularly mentioned are

Messers. Makinta Waidaki, Epsi Shanta, Ataro and her daughter Chokolechi. I had very enjoyable and fruitful discussion with the teachers of Metsar Primary School. They understand the purpose of my research very well and helped data collection with the cooperation of school children. Mr. Tammame Dejene, Headmaster of the school, was kind enough to allow me to have a class in the school.

My hearty thanks are also due to the following people: Mr. Gebre Yintiso, Assistant Lecturer, Addis Ababa University, Mr. Tim Fellow and other missionary people of SIM, Society of International Mission. In Jinka town, Mr. Fekermarkos Desta, Jinka High School. In Addis Ababa, Dr. Taddese Beyene and Dr. Girma Kidane and other staffs of the Institute of Ethiopian Studies (IES), Addis Ababa University and those of Japan International Cooperative Agency (JICA), and Japanese Embassy. Mr. Tasfai Hailu and Mr. Tasda Makkonen, Ministry of Culture. I would also like to thank all those who are not mentioned here.

Many people gave me on the constructive comments on the original article on which this dissertation was based, which were written in Japanese, in many occasion. Those whom I should mention the name are Dr. K. Fukui, and Professor Dr. Sasuke Nakao, Professor Yutaka Tani, Dr. Ryo Ogawa and my wife Michiyo. I would like to express my heatily thanks to them and also equally to all the others whom I could not mention their names.

Last but not least, again to my wife, Michiyo, and to

my sons, Yuki and Noriho for their patience and understanding in my long absence during the field work and also in the desperate moments of the writing-up period. I owe an incalculable debt. To her and to my children who also shared the joys and pains of my work. I wish to express my deepest gratitude.

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Table 1. Difference between genus Ensete and genus Musa.

	<u>Ensete</u>	<u>Musa</u>
	Monocarpic	Perennial
Way of propagation		
wild	seed	seed & sucker
cultivated	artificially induced sucker	sucker
Morphology		
Basal part of pseudostems	Not swollen	Swollen
Leaf blade and flowers	Attached	Separated
Fruits	Falling not separately	Separately
Flower	Hermaphrodite	unisexual
Distribution	Mainly in Africa and NE India, Myanmar Thailand, S.China, Philippine and New Guinea	Asia
Basic chromosome number	x=9	x=10, 11

After Simmonds (1960a, b, 1962) and Baker and Simmonds (1953)

Table 2. Distribution of the genus *Ensete*

Species	Distribution
1. <i>E. ventricosum</i> (Welw.) E. E. Cheesman.	Central part of Africa Cameroun (west end), Transvaal (south end). Ethiopia (northeast end)
2. <i>E. gillettii</i> (De Wild) E. E. Cheesman.	Central part of Africa From Sierra Leone to Transvaal
3. <i>E. homblei</i> (Bequaert ex De Wild) E. E. Cheesman.	South of Zaire. North of Zimbabwe. Restricted
4. <i>E. perrieri</i> (Claverie) E. E. Cheesman.	Madagascar
5. <i>E. glaucum</i> (Roxb.) E. E. Cheesman.	Myanma, Assam?, Thailand, SW. China, Philippine, New Guinea, Java
6. <i>E. superbum</i> (Roxb.) E. E. Cheesman.	W. India

After Simmonds (1962)

Table 3. Three Enseie species distributed in Africa.

	<u>E. ventricosum</u>	<u>E. gillettii</u>	<u>E. homblei</u>
Distribution	Eastern part of central Africa	Western part of central Africa	Southern Africa
Plant shape	Gigantic Banana-like	Medium	Small Canna-like
Seed size (mm)	12-17	7-9	5-6
Habitat	Wet swamp, river side	Moderately wet place	Dryland

After Baker and Simmonds (1953)

Table 4. Comparison of the seed size.

	Sample No.	Seed size min.-max.	Ave.	S.D.	References
<i>E. ventricosum</i>	40	1.64-5.67	2.72	0.92	Baker & Simmonds (1953)
<i>E. gillettii</i>	11	0.38-0.69	0.56	0.088	Baker & Simmonds (1953)
<i>E. homblei</i>	2	0.16-0.22	0.19	--	Baker & Simmonds (1953)
Collection:					Present report
Cultivated	1	----	2.81	--	Co. No. MS1986-12-16-7
Wild	2	2.98-4.04	3.51	--	Co. No. MS1986-12-19-1 Co. No. MS1986-12-19-2

Table 5. Difference between wild and cultivated population of ensete.

	Cultivated population	Wild population
Vernacular name	<u>agemi</u>	<u>gela</u>
Habitat	gardens around houses <u>tika haami</u>	swamp and riverbank <u>kau</u>
Mode of propagation	vegetative artificial	seed natural
Variation	recognized by vernacular names	recognized sometimes by the vernacular names of cultivated landraces
Corm	big	small
Taste of corm	not bitter	bitter
Base of pseudostem	enlarged	not enlarged
Population density at the habitat	high	low
Utilization by people	food and other multipurpose	not utilized
Ownership	owned by the head of the household	no ownership
Altitudinal zone of distribution(m)	1,200-2,800	1,200-1,600

Table 6. Cultivated plants of the Ari and its importance.

English Name	Ari Vernacular Name	Species	Importance in the area: under 1200m between 1200-1800m over 1800m
ensete	ageml	<u>Ensete ventricosum</u>	++
banana	muzi	<u>Musa spp.</u>	+
barley	gosu	<u>Hordeum vulgare</u>	-
wheat	zergi	<u>Triticum aestivum</u>	+
tef	gachi	<u>Eragrostis tef</u>	++
sorghum	rubi	<u>Sorghum bicolor</u>	+
finger millet	barga	<u>Eleusine coracana</u>	++
maize	pater	<u>Zea mays</u>	+
bean	wooka	<u>Phaseolus vulgaris</u>	+
cowpea	zaaka	<u>Vigna unguiculata</u>	+
lentil	singula	<u>Lens esculenta</u>	-
pea	ringa	<u>Pisum sativum</u>	-
broad bean	omula	<u>Vicia faba</u>	-
yam	asuni	<u>Dioscorea spp.</u>	++
taro	gabija	<u>Colocasia esculenta</u>	++
aerial yam	bolaboie	<u>Dioscorea bulbifera</u>	++
kale	ekena	<u>Brassica oleracea</u>	+
onion	shunkulut	<u>Brassica carinata</u>	-
amaranth	hada	<u>Allium cepa</u>	-
green pepper	kaariya	<u>Amaranthus spp.</u>	++
tomato	tamatin	<u>Capsicum annuum</u>	++
pumpkin	bota	<u>Lycopersicon esculentum</u>	++
tobacco	dampa	<u>Cucurbita sp.</u>	++
coffee	buna	<u>Nicotiana tabacum</u>	+
cotton	puuta	<u>Coffea arabica</u>	++
sesame	salit	<u>Gossypium hirsutum</u>	+
nuug	nuug	<u>Sesamum indicum</u>	+
		<u>Guizotia abyssinica</u>	n

++: very common

+ : common

- : rare

n : very rare

Table 8. Popular landrace names referred by lowlander and highlander with high frequencies in the Sida, Biyo and Baka area.

Chief's area	Sida	Lowland Biya	Baka	Highland
Order				
1	kaksa	gena	gufalakk	gena
2	garacaha	kaksa	mooset	karta
3	gena	alaka	asarat	daakai
4	joolak	karta	arpa	joolak
5	karta	salta	buguni	maga
6	mooset			mooset

Table 9. Frequency distribution and the order of named-landraces recalled by 22 informants of the Sida area, with their sex and age.

Landrace Name	Informant No.																						A	B	C
	38	17	12	20	18	11	23	8	9	42	10	16	24	30	1	2	3	4	6	19	5	15			
<i>balea</i>				5	4	1	3	1	1	2	3				1	2	3	3		3	1		14	33	2.3
<i>garachar</i>																							12	37	3.0
<i>gama</i>		1	1	4	1					1						1	4	7	4	8	2	3	11	38	3.4
<i>jodak</i>	4	2			3	2				2	4	2	3		3					10			11	39	2.7
<i>karla</i>	8			6			1			3						1	1	1	2	4			7	28	4.0
<i>manet</i>	3	2																6		6			7	24	3.4
<i>osundele</i>	5											6	1		2	4	5	3		3			6	26	4.3
<i>salla</i>							4		5		5			2	5			5					6	28	4.6
<i>gora</i>							2			7		4	1						9				4	16	4.0
<i>alaki</i>	1										7						2		6		1		3	10	3.3
<i>clakani</i>										4													3	6	2.0
<i>maga</i>													5						1				3	13	4.3
<i>mauna, manuna, manonell</i>	6				2		5												2				3	11	3.6
<i>arpe</i>																				4			3	9	4.5
<i>ila</i>							6											4		7	2		2	10	5.0
<i>zinka</i>																							2	3	1.5
<i>aljakumiso</i>	2		1							4													1	4	
<i>aneton, arisa</i>					3																		1	3	
<i>arbi</i>	11																						11	2	
<i>babud, babudon</i>						2																	1	3	
<i>baisamutuki</i>									3														1	6	
<i>bayya</i>												6											1	6	
<i>babulakk</i>												5											1	5	
<i>abunuch</i>																							1	5	
<i>dihki</i>																				5			1	5	
<i>gaki, gupa</i>																							1	1	
<i>gala, gaul' ott</i>																							1	6	
<i>unfakkk</i>																			5				1	5	
<i>huti</i>																		6					1	8	
<i>inada</i>																			7				1	7	
<i>aruna</i>	10																						1	10	
<i>luokk</i>	9																						1	9	
<i>wy nala</i>																							1	4	
<i>koyumakk</i>	2																						1	7	
<i>aba jodakk</i>																							1	4	
<i>zelama</i>																							1	7	
No. of referred landraces/ Age	11	3	1	6	4	2	7	4	5	7	7	6	2	5	3	5	8	7	10	5	2	6	116		
	7	11	13	14	15	17	18	20	20	25	25	25	25	30	30	30	30	30	30	40	40				

- A; Frequency of a given landrace referred by the informant.
 B; Sum of the numbers of recalled order.
 C; Average of B.

Table 10. The knowledge of ensete landrace names by the sixth-year primary school children in Metsar village.

Landrace names	Informant No.												Freq. of referred landraces
	9	14	5	8	10	4	6	1	2	13	15		
kaksa	5			1	4		1	3	2	1		7	
karta	2	7	5			3		1				5	
gena	1	1	1		1	2						5	
joolak	3		4	3	3					3		5	
osade				2	5				1		2	4	
gufalak	8					4				2		3	
mooset			3	4							1	3	
garacha	4	2					2					3	
daakai	7	3					3					3	
salta					2			2				2	
baka sulay		6					4					2	
naga	6	4										2	
mana									3			1	
gaya						1						1	
gel			2									1	
tilaglees					5							1	
intada		5										1	
No. of recalled landraces	9	7	5	5	5	4	4	3	3	3	2	49	
Age	18	17	15	16	14	14	13	12	14	17	14		

Table 11. Meaning of the vernacular landrace names.

Landrace name	Meaning	Explanation
<u>barga</u>	finger millet	Whole appearance looks like finger millet.
<u>tsala</u>	<u>Arisaema</u> sp.	The taste and color of the fermented starch looks like that of <u>Arisaema</u> sp.
<u>arbi</u>	a weed, Compositae	?
<u>oisi</u>	bamboo	Grows fast like bamboo.
<u>zergina</u>	<u>zergi</u> =wheat	The taste and color is like that of wheat.
<u>ila</u>	flour	Tastes like cereal flour when made into fermented starch
<u>washinga</u>	<u>washi</u> =fermented starch	? Suitable for making <u>washi</u> .
<u>daatsakan</u>	<u>daatsa</u> =porridge	Suitable for making porridge.
<u>goolet</u>	<u>gola</u> =a kind of alcoholic beverage	Suitable for making beer.
<u>mooset</u>	<u>mosa</u> =corm, or a name of recipe	Suitable for cooking as <u>mosa</u> .
<u>sekaar</u>	sugar	Tastes sweet.
<u>gofa</u>	place name	Brought from Gofa area.
<u>intada</u>	by itself	Grows suckers by itself
<u>katsumi</u>	spear	Appearance is like spear.
<u>mana</u>	caste name	?
<u>worja mocha</u>	personal name	?
<u>uba.joolak</u>	<u>uba</u> =place name	Mainly cultivated in Uba area. Appearance differs from <u>joolak</u> .
<u>tssaami gena</u>	<u>tssami</u> =white	More whitish than <u>gena</u> .

Table 12. Some ensete landraces with their characteristics.

Vernacular name of land-race	Characteristics
<i>aasha</i>	Little pigmentation on the midribs and petioles. Roundish at the basal part. Compared with <i>daakai</i> , it has wider leaves and blackish at the base of pseudostems.
<i>alaka</i>	Little pigmentation on the midribs and petioles. Corn quality is similar to <i>daakai</i> , but <i>alaka</i> is quicker to be boiled. Narrow leaves with no creases.
<i>daakai</i>	Thin red stripe on the midribs and petioles. Blackish at the base of pseudostems. Leaves with creases along with veins.
<i>garecha</i>	Very whitish midribs and petioles. Plant height is low and slow to grow. It takes six years to reach the height of a two-year <i>daakai</i> . It has short petioles. The corn and leaves are large in size.
<i>gena</i>	Gigantic. Reddish brown to black midribs and petioles. It is used only for the fermented food stuff called <i>washi</i> . The corn cannot be eaten. It takes about five years to mature.
<i>intada</i>	Peculiar landrace which lost its apical dominance. It has voluntary suckers like those of bananas. The corn and basal part of the pseudostems don't grow large. Leaves are utilized for various material cultures. It is not utilized for food.
<i>joolak</i>	Red pigmentation on the midribs and petioles. Red spotted at the basal part of pseudostems. Narrower leaves than <i>shupalak</i> .
<i>kaksa</i>	Red pigmentation on the midribs and petioles. Leaves with creases and easy to be torn. Not suitable for wrapping purposes. The corn has a bitter taste. It takes three years to give flowers.
<i>mooset</i>	Red stripe on the midrib and petioles. The corn is boiled easily and gives floury starch.
<i>oosade</i>	It has dark red to black color on the midrib and petioles.
<i>salta</i>	Red pigmentation on the midrib and petioles. Narrower leaves longer petioles than those of <i>shupalak</i> and <i>joolak</i> . Compared with <i>tsala</i> , it grows as quickly as bamboo.
<i>shupalak</i>	Red pigmentation on the midrib and petioles.
<i>tsala</i>	Red pigmentation from the basal part of the petioles to the top of them evenly. Slower to grow than <i>salta</i> .
<i>zinka</i>	Red pigmentation on the midrib and petioles. Long and wide petioles. Narrow and tough leaves. Petioles twist upwards.

Table 13. Criteria of classification of ensete by the Ari people.

1. Pseudostem: color, pigmentation, length
 2. Basal part of pseudostem: color, pigmentation, shape (swelling)
 3. Leaves: width, shrink, thickness, toughness
 4. Plant figure: height, openness of the leaves
 5. Growth speed: maturity duration, flowering period
 6. Use: good for fermented products, for boiling and for wrapping
 7. Taste: sweetness, fluorines
 8. Propagation: by artificially induced bud, by self-induced bud
-

Table 14. People know the names of ensete which they do not grow in their garden.

	Landraces cultivated in the garden	Landraces not cultivated but known to the informant
Mr E.S.	gena, intada, joolak, kaksa, salta (5)	alaka, arpa, gaya, gufalak karta, maga, shupalak (7)
Mr M.W.	aasha, daakai, garecha, gena, joolak, kaksa, mooset, oosade, salta, shupalak, zinka (11)	gaya, intada, gufalak, alaka, karta, maga (6)

N.B. 1. Hearing was done in the ensete garden of respective informant.

2. Number in parentheses is the total number of landraces mentioned.



Figure 1. Research area.

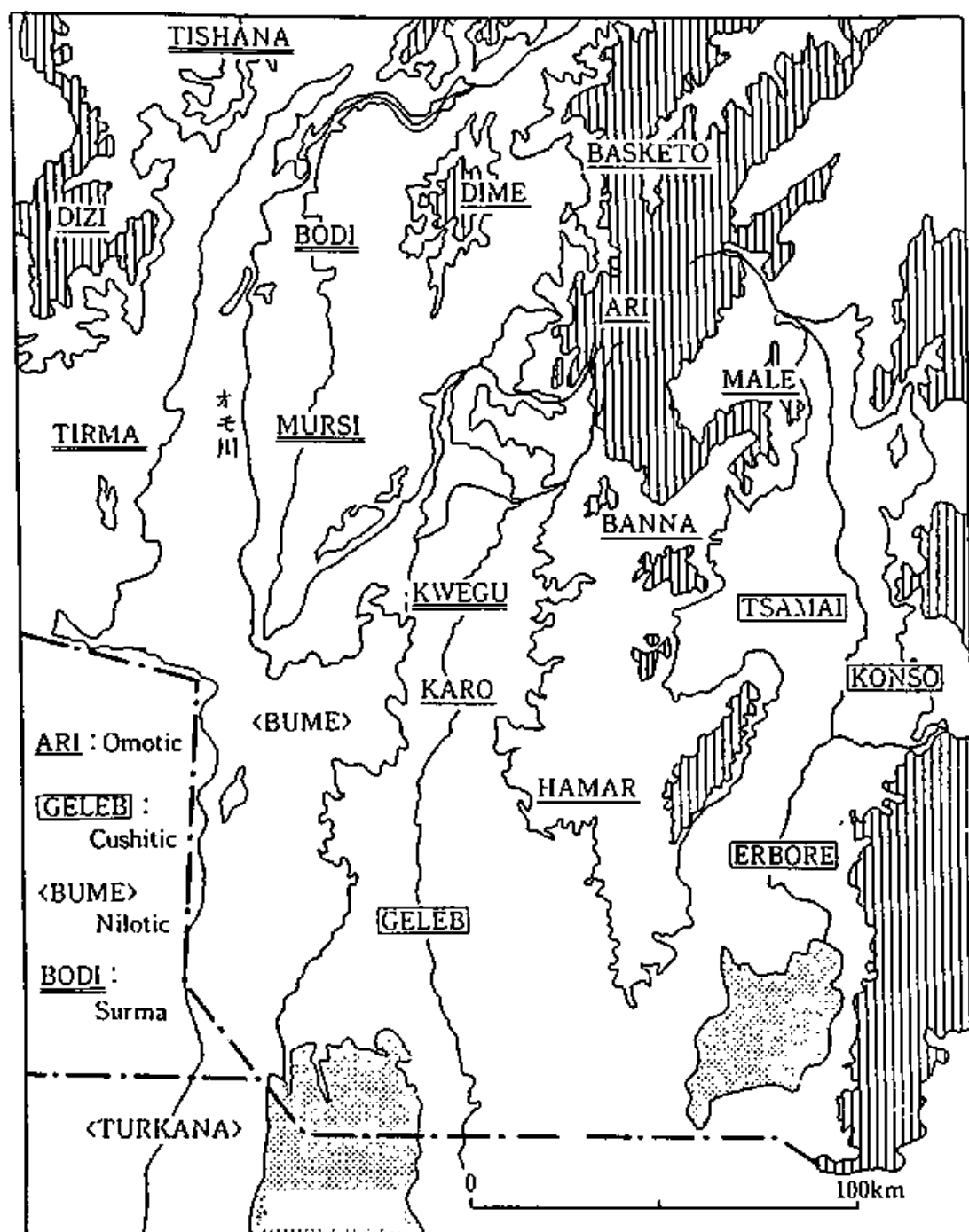


Figure 2. Distribution of ethnic groups in southwestern Ethiopia.

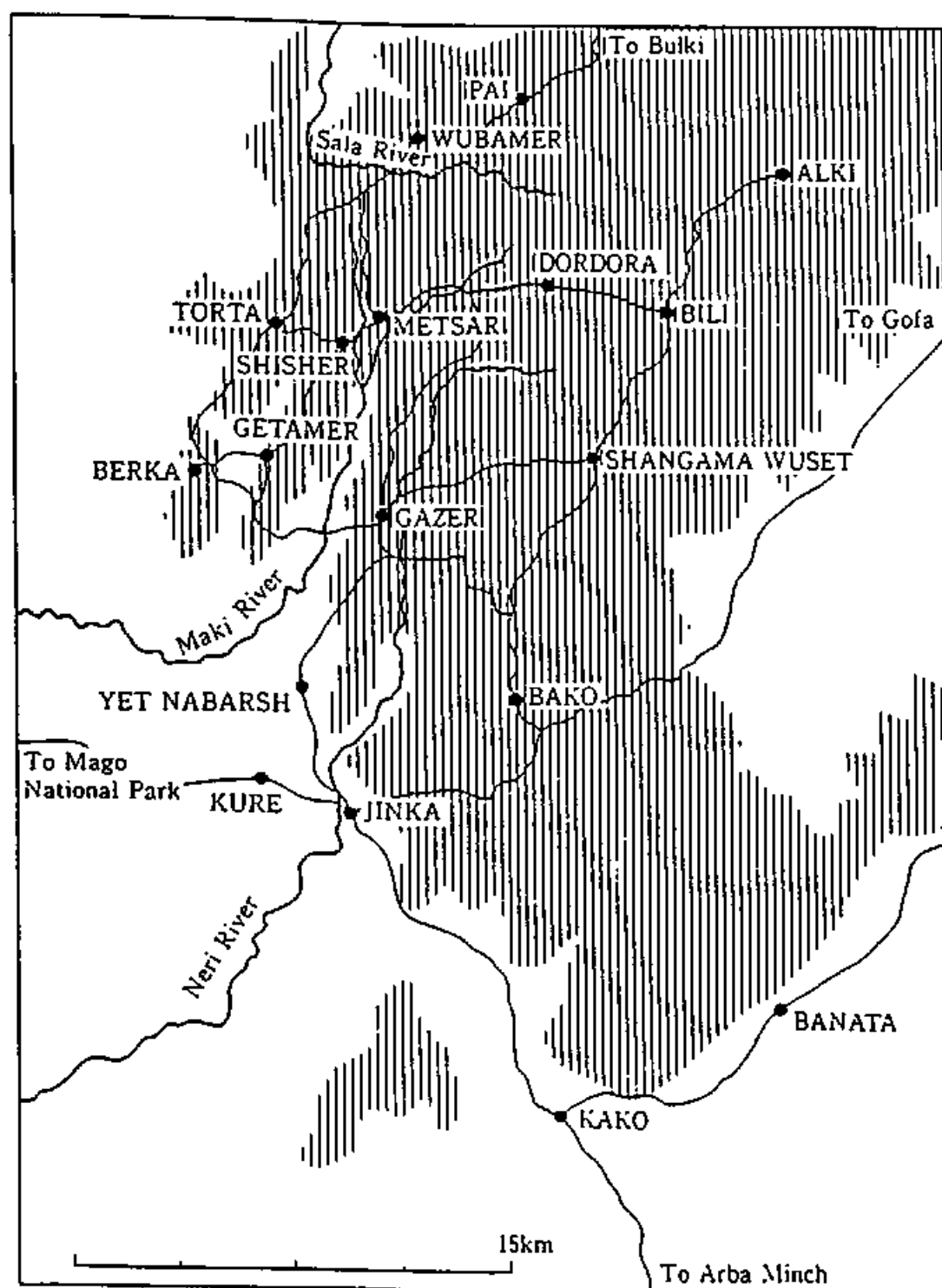


Figure 3. Topography of the research area. The area with shadow is over 1,600 m above sea level.

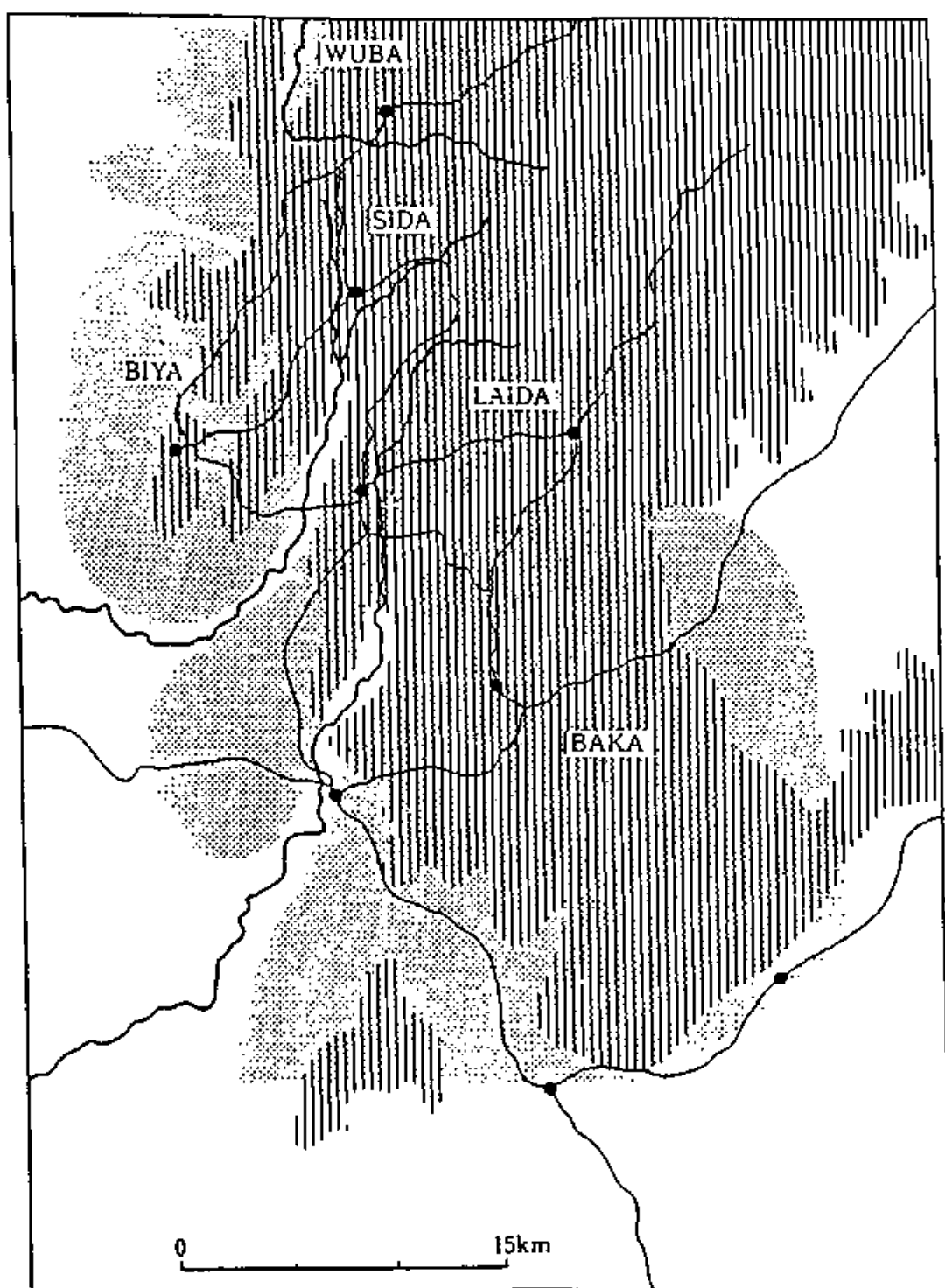


Figure 4. Territories of the local chief, baabi of the Ari.

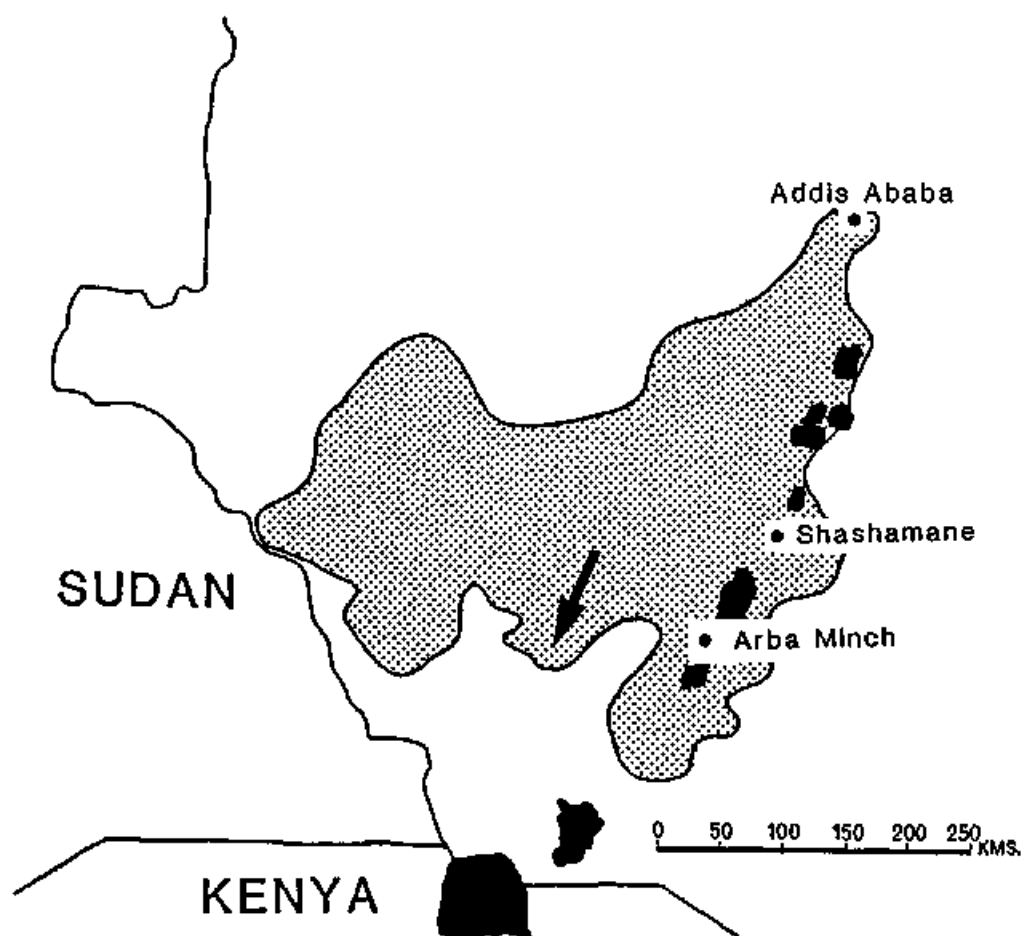


Figure 5. Distribution of cultivated ensete in southwestern Ethiopia. Drawn after Shack (1966) and Westphal (1975)

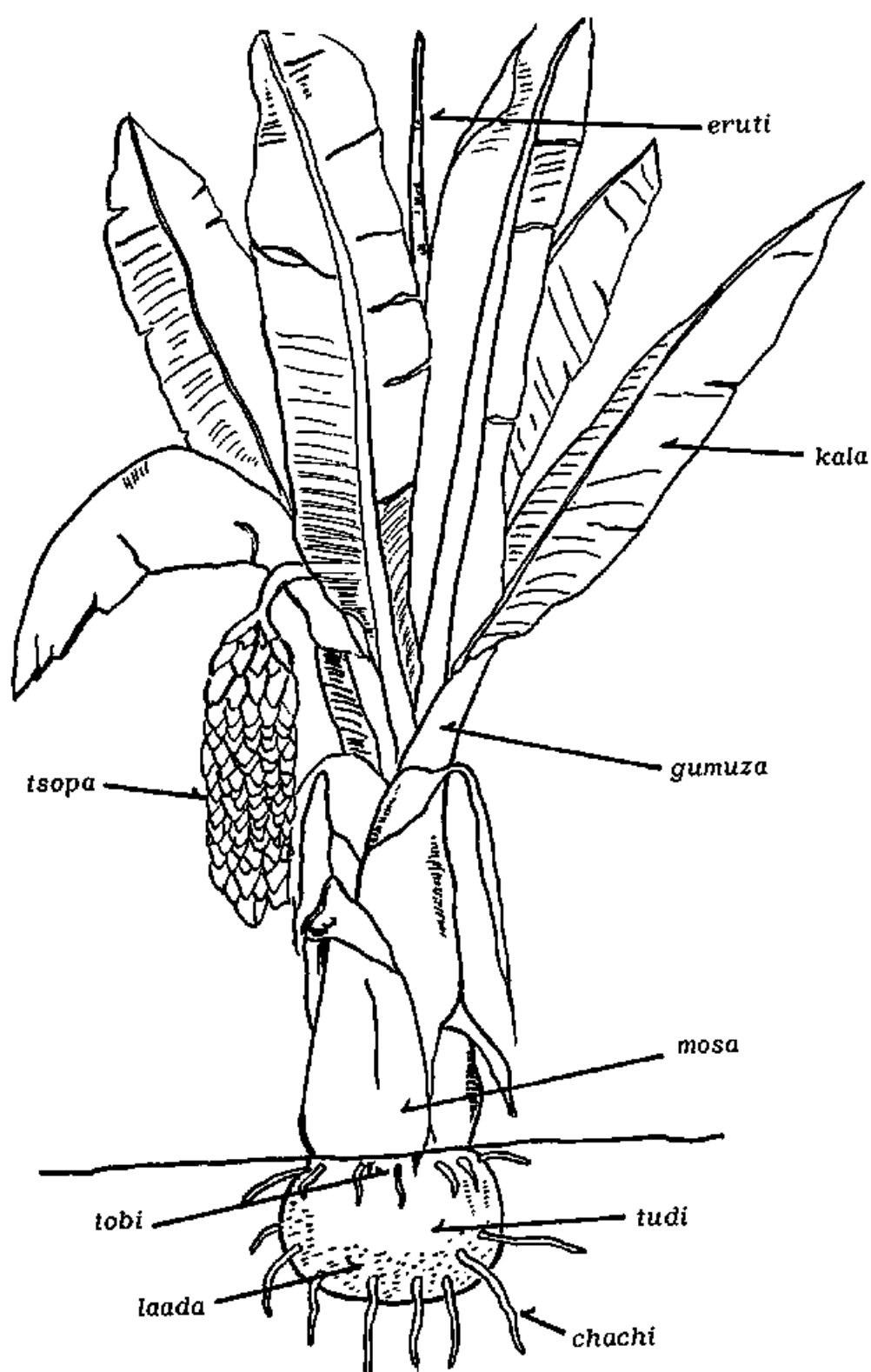


Figure 6. Ari nomenclature of ensete.

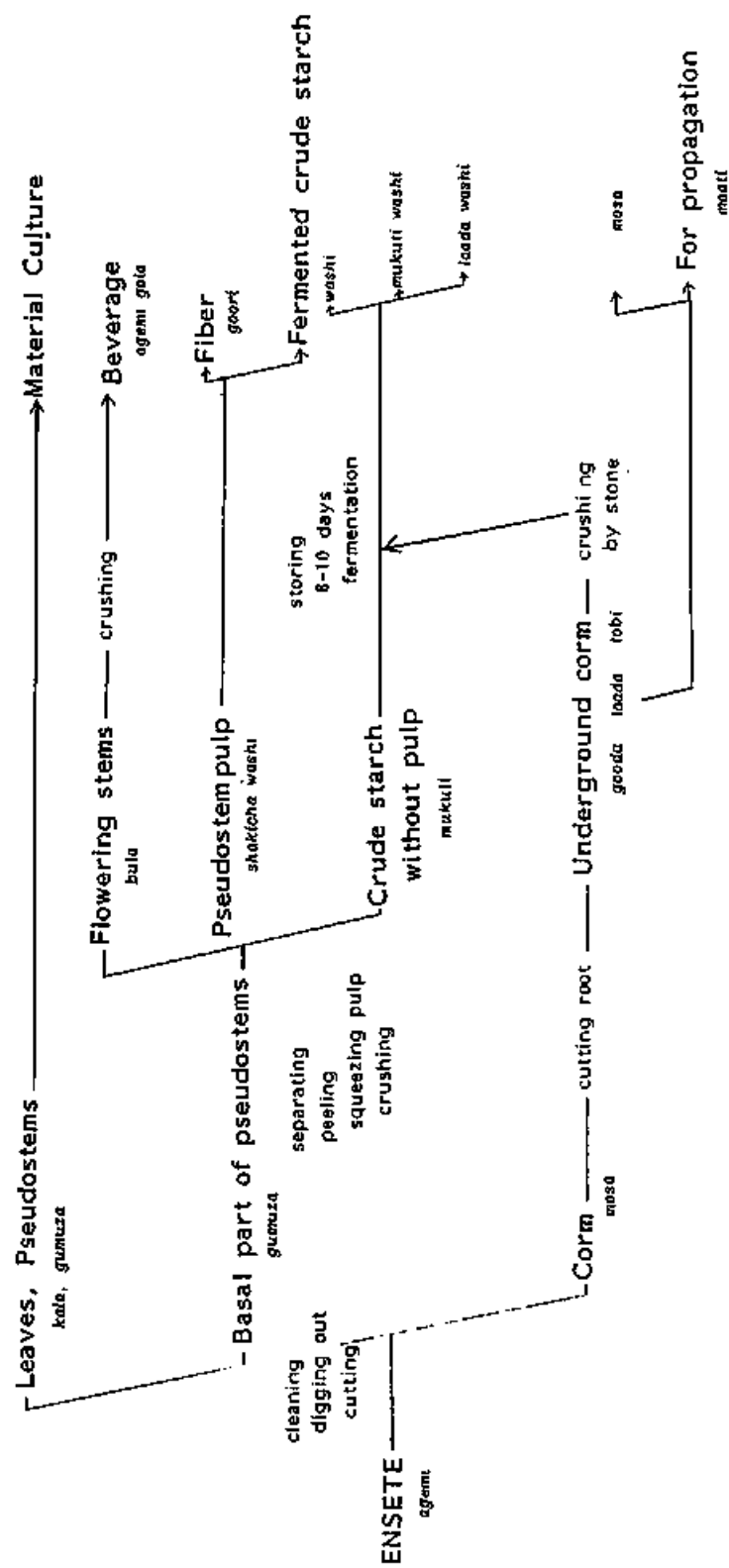


Figure 7. Processing of the ensete.

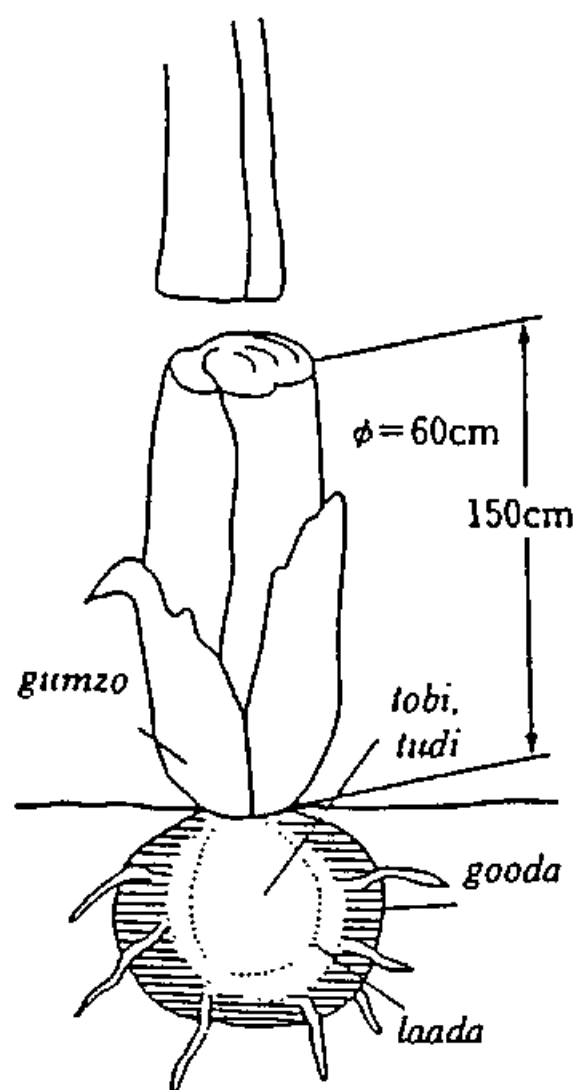


Figure 9. Names of the edible parts of ensete.

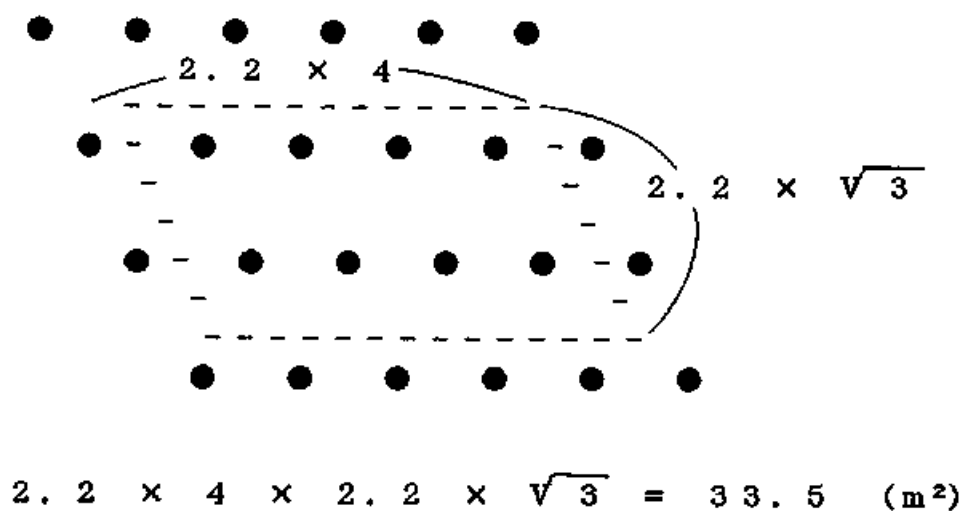


Figure 10. Spatial arrangement of ensete which gives highest planting density with 220 cm distance from each other

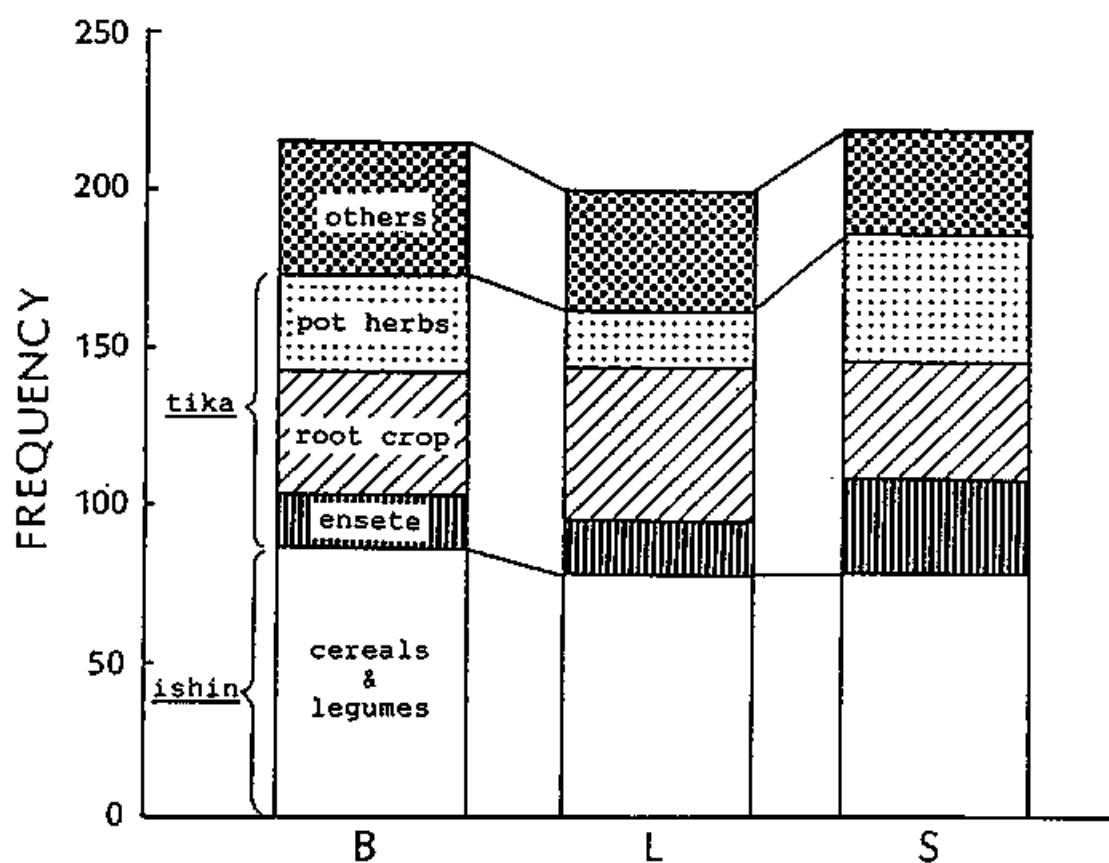


Figure 11. The rate of ensete food in the diet of the Ari. The survey was done between Dec. 1, and Dec. 7, 1986 for seven days.

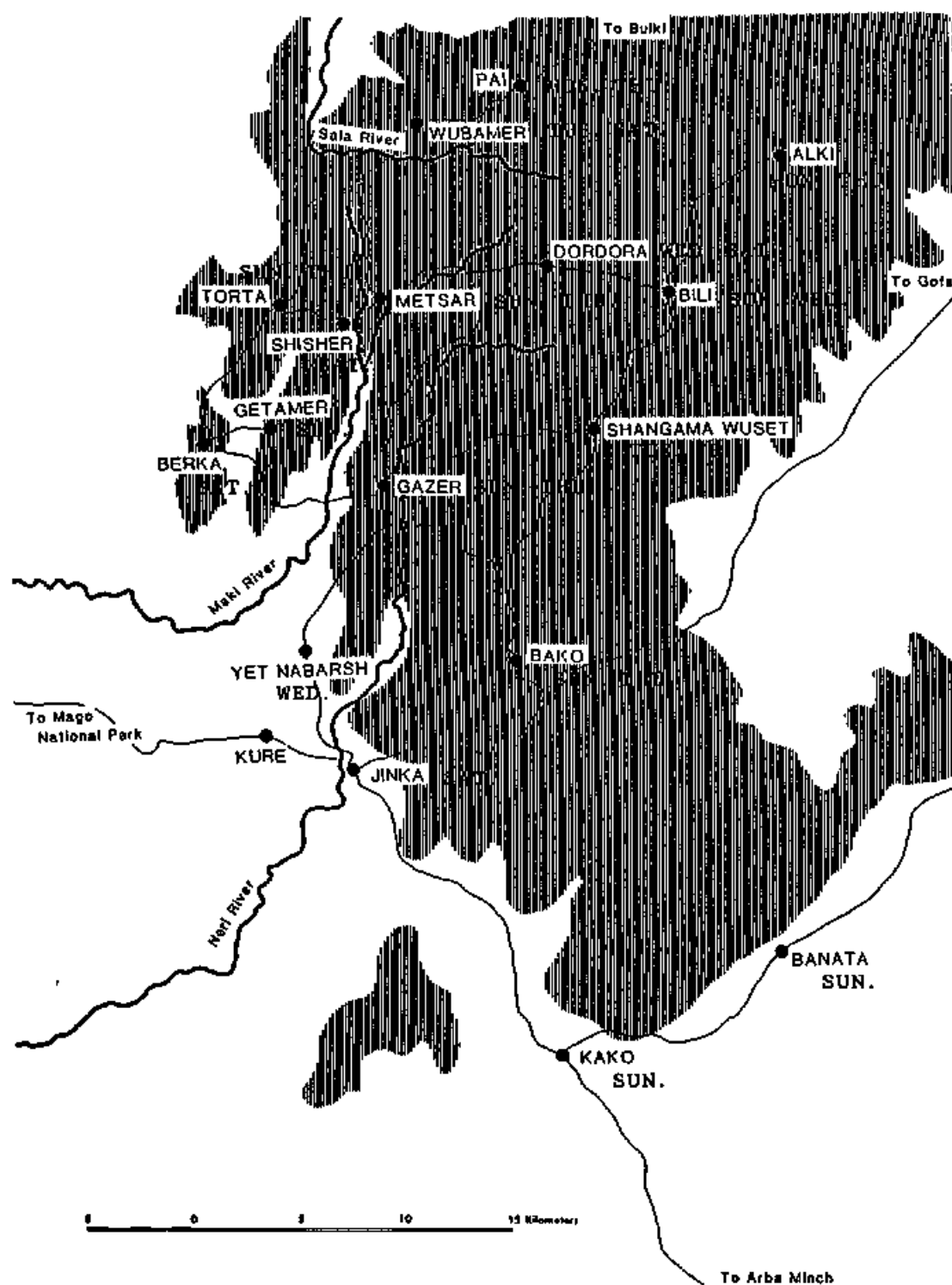


Figure 12. Market places and their periodical market days. At all the markets observed, the fermented ensete products, washi, were found to be sold.

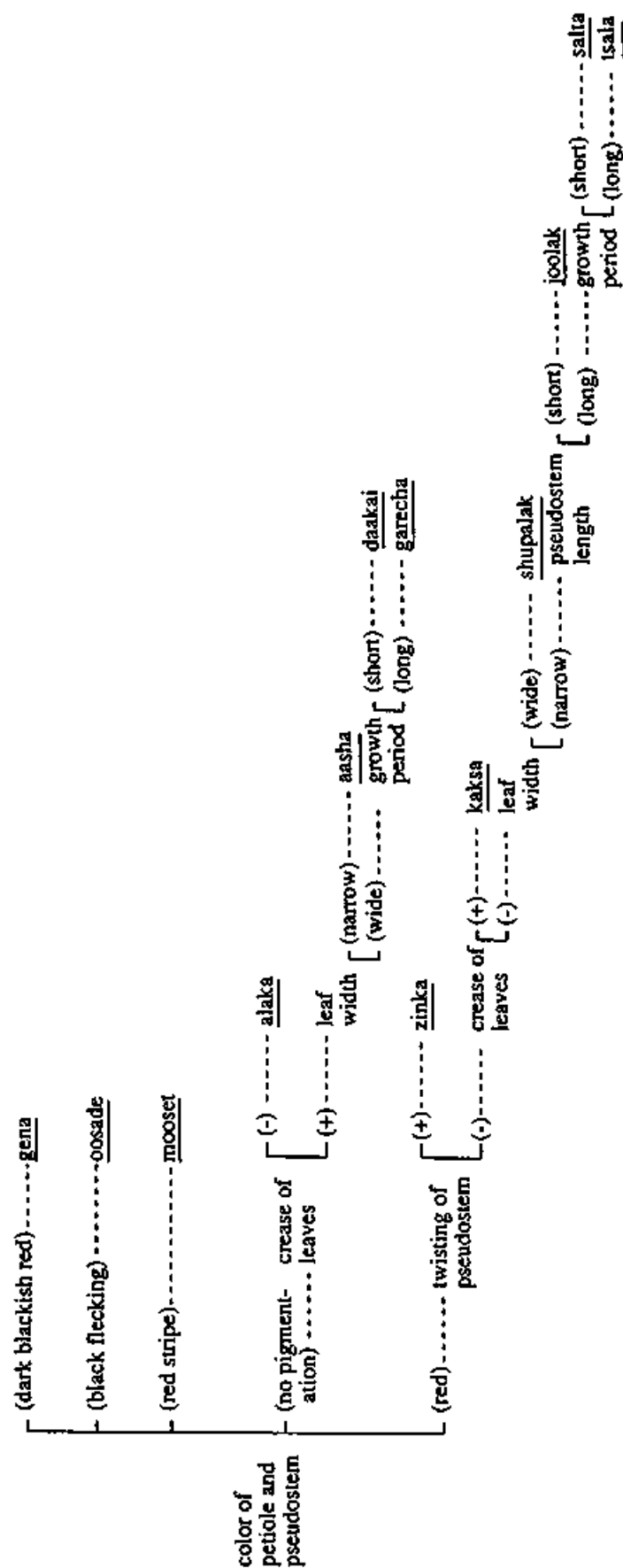


Figure 13. Classificatory dendrogram of 13 ensete landraces.

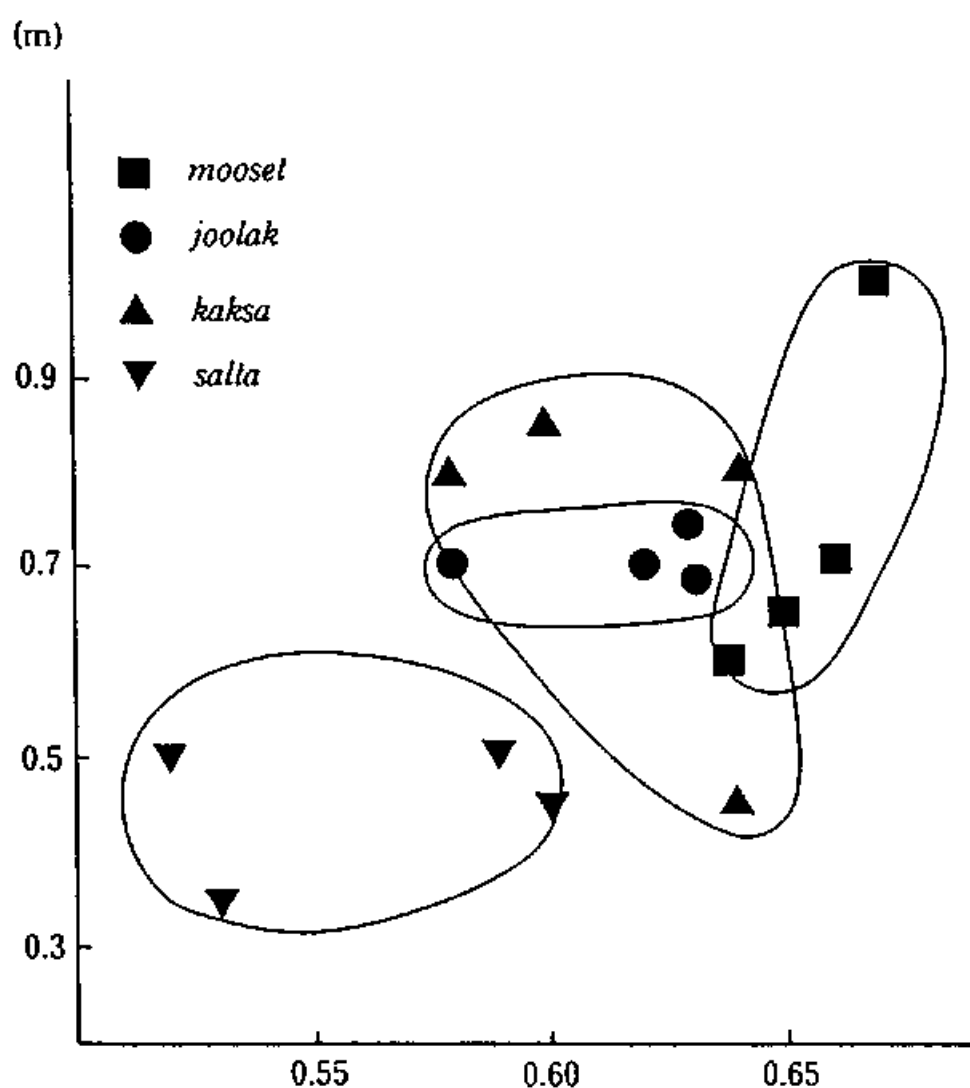


Figure 14. Differentiation of the four ensete landraces by quantitative characteristics. Y: Leaf width. X: Leaf length to Pseudostem length ratio.

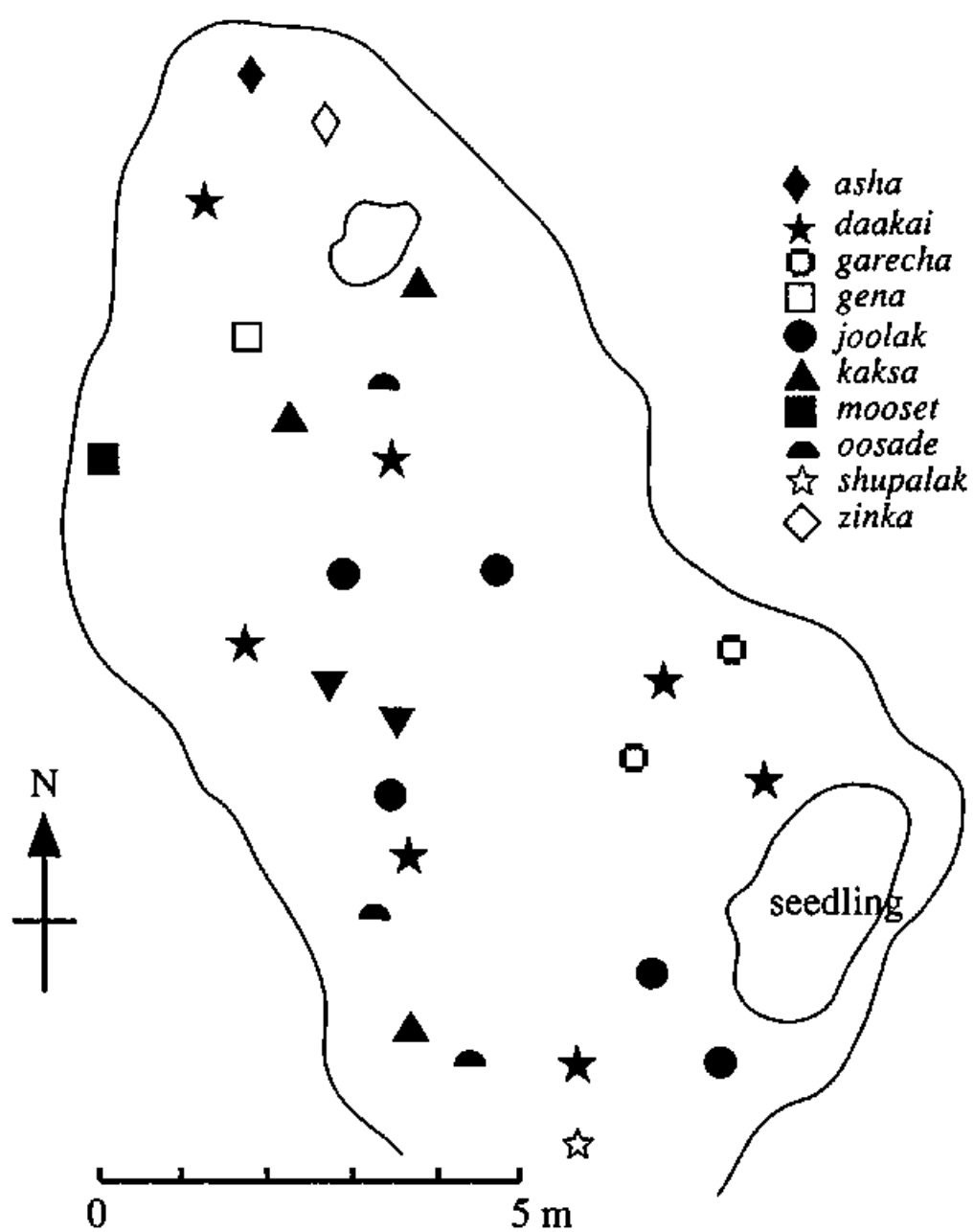


Figure 15. An example of ensete planting pattern in the garden.

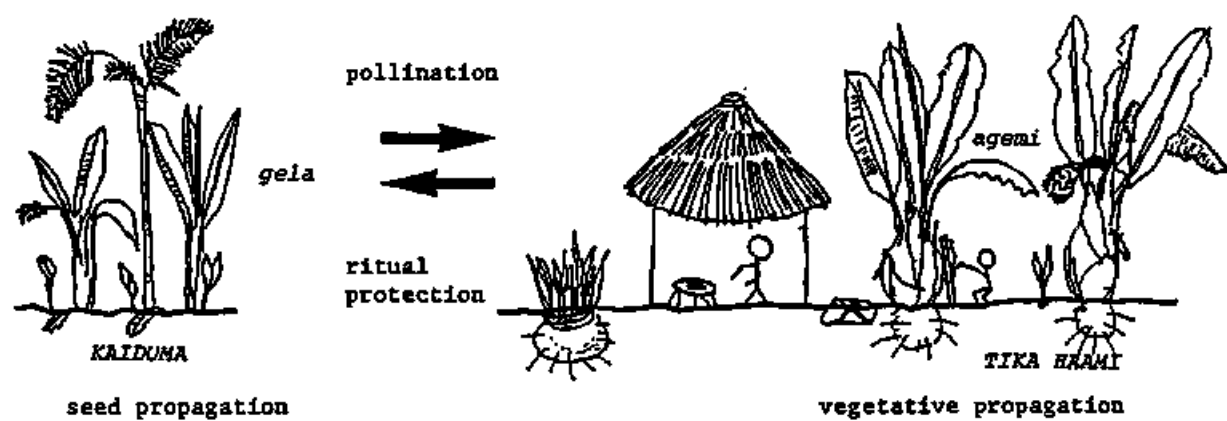


Figure 16. Schematized relationship between cultivated and wild population of ensete.



Plate 1. An overview of the Ari's homestead. The house is enclosed by the grove of ensete. At Shangama mountains.



Plate 2. Cultivated ensete. Ensete ventricosum (Welw.) E.
E. Cheesman. At Metsar village, South Omo Province.



Plate 3. Seeds of wild ensete, Ensete ventricosum (Welw.)
E. E. Cheesman. Collection No. MS1986-12-19-1. At the
swampy riverside, 1.5 km south from the Metsar village
center.



Plate 4. Inflorescence and flowers of cultivated ensete.
Ensete ventricosum (Welw.) E. E. Cheesman. At Ubamer town.



Plate 5. Fruits of cultivated ensete, Ensete ventricosum (Welw.) E. E. Cheesman. From left to right, a cross section, a longitudinal section and a whole of the fruits.

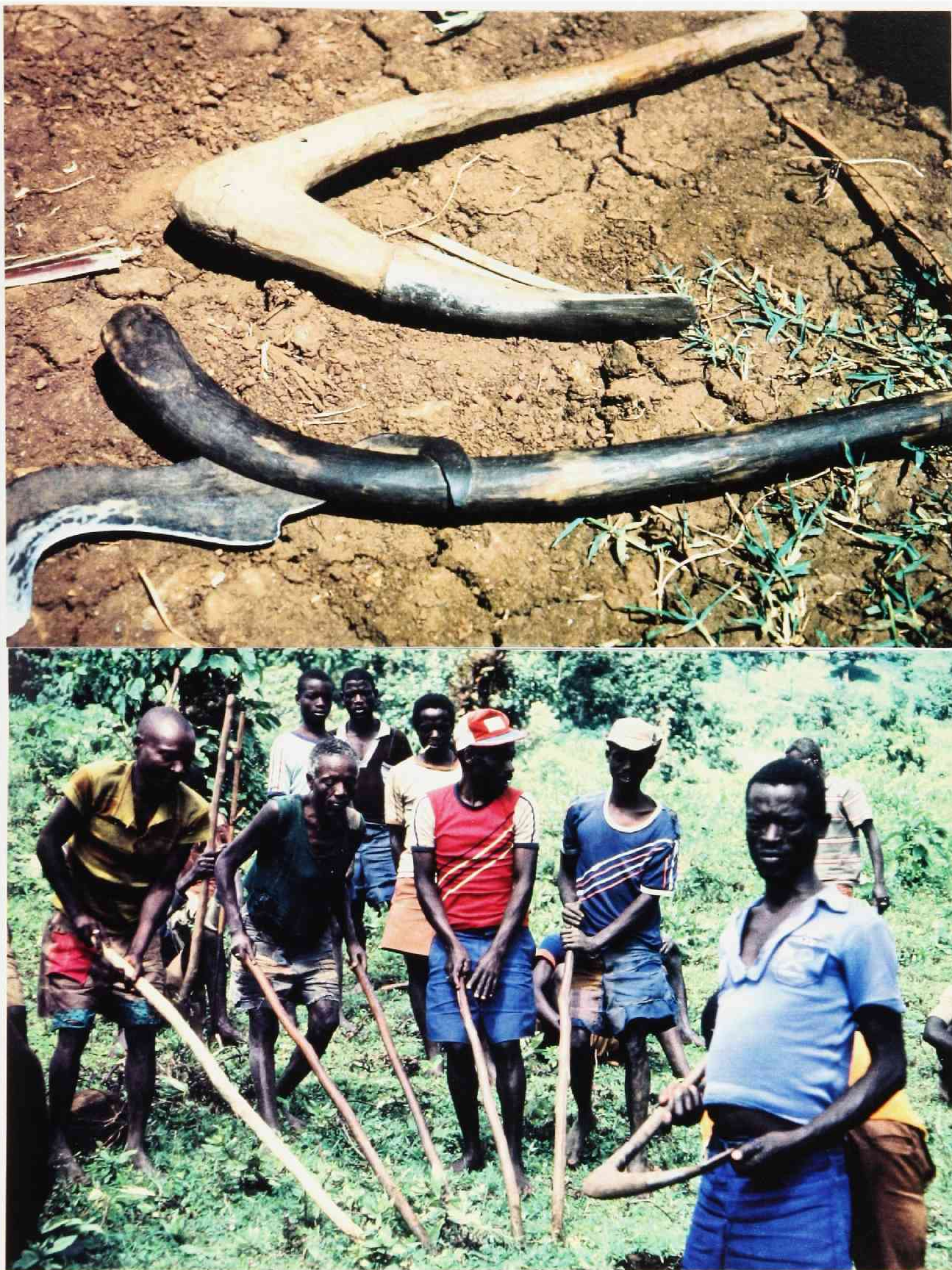


Plate 6. A: Upper: Hand-hoe, gosha. Lower: Sickle, wali.
 B: Digging stick, boila.



Plate 7. Spontaneous habitat of wild ensete. Ensete ventricosum (Welw.) E. E. Cheesman. Along the branch stream of Maki river near Metsar village.



Plate 8. Kaiduma: Ritual sanctuary of the wild ensete population. Wild ensete plants in kaiduma are distributed sparsely making several colonies.



Plate 9. Osuna ahaaka, wooden board specially made for squeezing down the pulp from pseudostem.

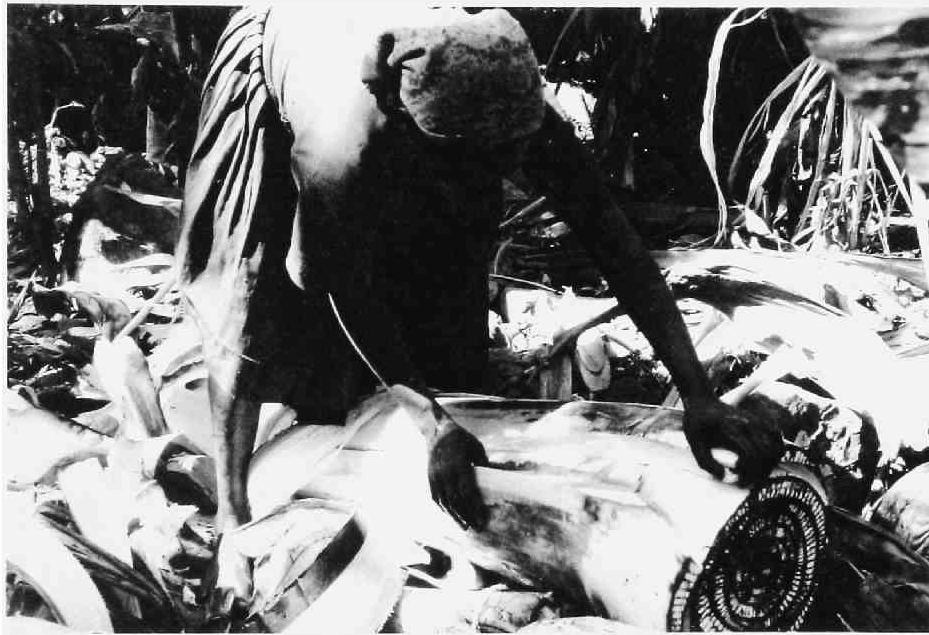


Plate 10. Pseudostem is separated in order to take out the water, daltsi nok, contained in the cell-like structure.



Plate 11. Mosa, underground corm of ensete. Crushed mosa can be also added to shakicha washi for fermentation.



Plate 12. The pulp is squeezed down out of the pseudostem by means of a split bamboo stick.



Plate 13. The pulp is mashed with the bamboo stick.



Plate 14. The mashed pulp is placed in the pit being wrapped by ensete leaves.



Plate 15. Wrapped pulp of ensete is tied tightly by the ensete pseudostem fiber. The top is covered by the ensete leaves but with no soil.



Plate 16. Fermented product of ensete, washi is cut by special knife many times in order to remove the fibrous substance.



Plate 17 The washi is kneaded well by hands and ground on the stone plate for more than ten times.



Plate 18. Washi is shaped into a disk-like form with 3 to 4 cm in width and 30 to 40 cm in diameter, and wrapped with ensete leaves for baking.



Plate 19. Washi is baked for half an hour on one side, and 15 minutes on the other side. This is called washi katsu.



Plate 20. Dragon arum. Arisaema schimperanum Schott.
Right: edible variety, called tsala. Left: Inedible
variety, called torja.



Plate 21. Goods are wrapped by the ensete leaves and tied by the pseudostem fiber.



Plate 22. Fiber from ensete pseudostem can be made into strong rope.



Plate 23. Ensete leaves are indispensable mat in the market place.



Plate 24. Women's skirts made of ensete leaves.

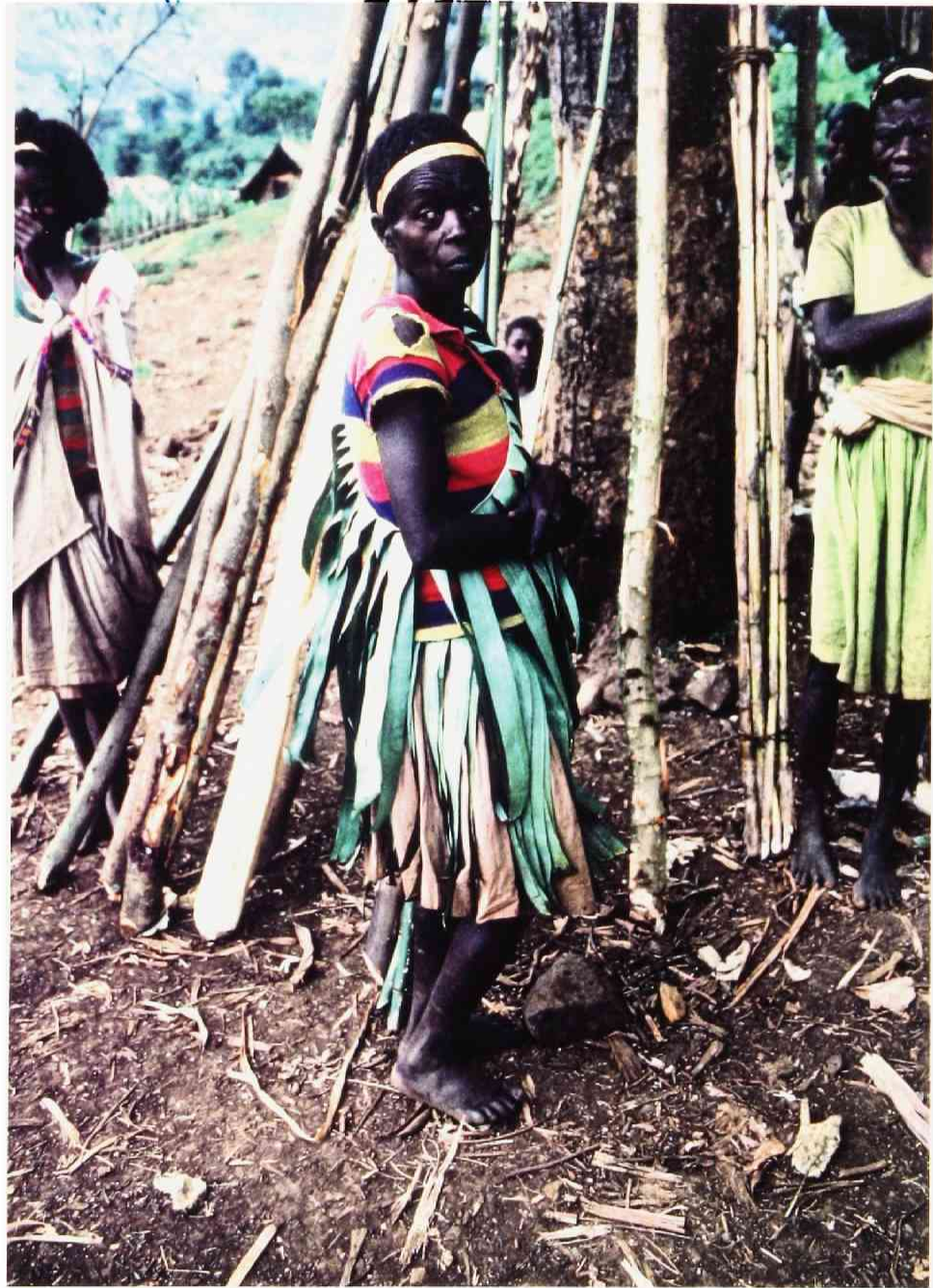


Plate 25. Funeral costume made of ensete leaves.